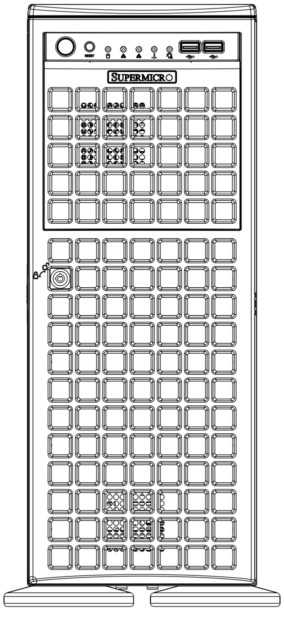
SUPERO®

SUPERSERVER
7046GT-TRF
7046GT-TRF-TC4


SUPERMICRO

USER'S MANUAL

Revision 1.0

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 7046GT-TRF/7046GT-TRF-TC4. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 7046GT-TRF/7046GT-TRF-TC4 is based on the SC747TQ-R1400B 4U/Tower rackmount server chassis and the Super X8DTG-QF serverboard. Please refer to our web site for an up-to-date list of supported operating systems, processors and memory.

The only difference between the SuperServer 7046GT-TRF and SuperServer 7046GT-TRF-TC4 is that the latter includes the nVidia Tesla Graphics Processor Unit (GPU).

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the Super X8DTG-QF serverboard and the SC747TQ-R1400B chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the system into a rack and check out the server configuration prior to powering up the system. If your server was ordered without the processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer to this chapter for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the system.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X8DTG-QF serverboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC747TQ-R1400B 4U/Tower rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring Serial ATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS POST Messages

Appendix B: BIOS POST Codes

Appendix C: System Specifications

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Chapter 1

Introduction

1-1 Overview

The SuperServer 7046GT-TRF/7046GT-TRF-TC4 is a supercomputing server that is comprised of two main subsystems: the SC747TQ-R1400B 4U/Tower server chassis and the X8DTG-QF dual Intel Xeon processor 5500 series serverboard. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the server, as listed below:

- Two 3.8-cm 4-pin PWM fan assemblies (FAN-0082L4)

- Four 9.2x3.8 cm 4-pin PWM fan assemblies (FAN-0114L4)

- Two 4U active CPU heatsinks (SNK-P0035AP4)

- SATA accessories:
  I/O shield (MCP-260-00025-0N)
  One HD backplane (BPN-SAS-747TQ)
  Six 35-cm SATA cables (CBL-0061L)
  Two 40-cm PBF 8-pin to 8-pin ribbon cable with tube for SGPIO (CBL-0157L)
  Eight 3.5" hard disk drive trays (MCP-220-97301-0B)
  Three 5.25" drive trays (MCP-220-00073-0B)

- Chassis cables:
  One 30-inch Round 16 to 16-pin ribbon front panel cable (CBL-0071L)
  Four 20-cm 4 to 4-pin middle fan power extension cables (CBL-0216L)
  Two 30-cm 4 to 4-pin rear fan power extension cables (CBL-0286L)

- One 4U 17.2" width rail set (MCP-290-00059-0N) (optional)

- Four NVidia C1060 Tesla GPU add-on cards
  (AOC-GPU-NVC1060) (SUPERSERVER 7046GT-TRF-TC4 Only)

- One Super Server 7046GT-TRF/7046GT-TRF-TC4 User's Manual

- One (1) Supermicro CD containing drivers and utilities

1-2 Serverboard Features

At the heart of the SuperServer 7046GT-TRF/7046GT-TRF-TC4 lies the X8DTG-QF, a dual processor serverboard based on the Intel 5520 (IOH-36D) chipset. Below are the main features of the X8DTG-QF. (See Figure 1-1 for a block diagram of the chipset).

Processors

The X8DTG-QF supports two Intel® 5500 Series (LGA 1366) processors supporting two full-width Intel QuickPath Interconnect (QPI) links with a total of up to 51.2 GT/s Data Transfer Rate (6.4 GT/s per direction). Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X8DTG-QF has twelve 240-pin DIMM slots that can support up to 96 GB of registered ECC DDR3-1333/1066/800 SDRAM or up to 24 GB of unbuffered ECC/non-ECC DDR3-1333/1066/800 MHz SDRAM. Modules of the same size and speed are recommended (for Unbuffered ECC/Non-ECC memory, a maximum of 2 GB per DIMM is supported). See Chapter 5 for details.

Serial ATA

A SATA controller is integrated into the South Bridge (ICHR10R) section of the chipset to provide a six-port 3/Gbs SATA subsystem, which is RAID 0, 1, 5 and 10 supported (RAID0, RAID1, RAID10, RAID5 supported in the Windows OS Environment and RAID 0, RAID 1, RAID 10 supported by the Linux OS). The SATA drives are hot-swappable units.

Note: The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the Serial ATA drives.

PCI Expansion Slots

The X8DTG-QF has four PCI-E Gen. 2.0 x16 slots (Slot 4, Slot 6, Slot 8, Slot 10), one PCI-E Gen. 2.0 x4 (in x16) slot (Slot 2), one PCI-E 2.0 x4 (in x8) slot (Slot 11), one PCI-E Gen. 1.0 x4 (in x16) slot (Slot 1) and two PCI 33 MHz slots (Slot 3, Slot 5) for a total of nine (9) PCI expansion slots.

Onboard Controllers/Ports

The color-coded I/O ports include one COM port (an additional COM header is located on the serverboard), a VGA (monitor) port, ten USB 2.0 ports (six rear USB ports, two front headers, and two Type A connections), PS/2 mouse and keyboard ports, IPMI dedicated LAN port, High Definition Audio ports and two Gb Ethernet ports.

IPMI

IPMI (Intelligent Platform Management Interface) is a hardware-level interface specification that provides remote access, monitoring and administration for Supermicro server platforms. IPMI allows server administrators to view a server's hardware status remotely, receive an alarm automatically if a failure occurs, and power cycle a system that is non-responsive.

Other Features

Other onboard features that promote system health include onboard voltage monitors, auto-switching voltage regulators, a chassis intrusion header, keyboard wakeup from soft-off, console redirection, chassis and CPU overheat sensors, fan status monitor with firmware control, Pulse Width Modulation (PWM) Fan Control, power-up mode control for recovery from AC power loss, main switch override mechanism, ACPI Power Management, system resource alert via Supero Doctor III, virus protection and BIOS rescue.

1-3 Server Chassis Features

The following is a general outline of the main features of the SC747TQ-R1400B server chassis.

System Power

Each SC747 chassis model includes a Gold level 1400W High-efficiency redundant (1+1) power supply (93%), rated at 1400 Watts. In the unlikely event your power supply fails, replacement is simple and can be done without tools. The AC power cord should be removed from the system before servicing or replacing the power supply. See Chapter 6 for details.

Mounting Rails (optional)

The SC747 can be placed in a rack for secure storage and use. To setup your rack, follow the step-by-step instructions included in this manual in chapter 2.

Hard Drive/Drive Bays

The SC747 Chassis features eight slots for SAS/SATA drives. These drives are hot -swappable. Once set up correctly, these drives can be removed without powering down the server.

Each SC747 Chassis provides three 5.25” peripheral drive bays for floppy drives, DVD-ROM/CD-ROM Drives, or additional hard drives

Front Control Panel

The control panel on the server provides you with system monitoring and control. LEDs indicate system power, HDD activity, network activity, system overheat, UID and power supply failure. A main power button and a system reset button are also included.

Cooling System

The SC747 chassis accepts four system fans and two rear exhaust fans. System fans are powered from the serverboard. These fans are 4U high and are powered by 4-pin connectors.

Backplane

Each SC747 chassis comes with a 4U backplane. Depending on your order, your backplane will accept SAS/SATA. For more information regarding compatible backplanes, view the appendices found at the end of this manual. In addition, visit our Web site for the latest information: http://www.supermicro.com.

1-4 GPU Subsystem (7046GT-TRF-TC4 Only)

The 7046GT-TRF-TC4 is a parallel processing multiple-GPU server. It includes four NVIDIA® Tesla™ C1060 GPUs with multiple x16 non-blocking native Gen2 PCI-Express connectivity that places these systems at the forefront of today's GPU computing solutions.

Refer to the NVIDIA web site (www.nvidia.com) for details on Tesla GPUs.

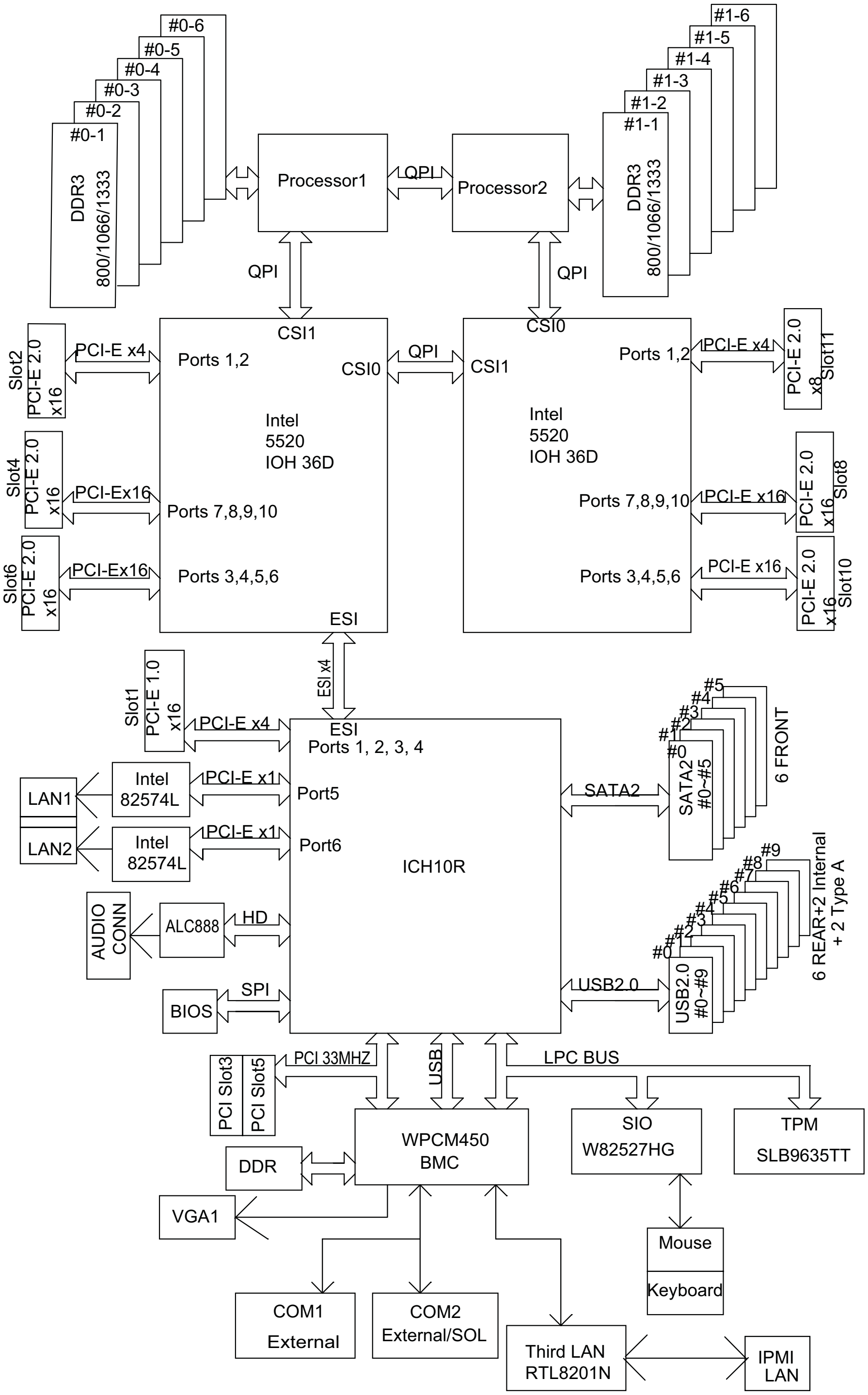
Notes:

The GPUs process complex image calculations and then route the data out through the VGA port on the serverboard.

The C1060 GPU model includes an active heatsink. Its fans work independently of the system fans and cooling parameters.

Figure 1-1. Intel 5520 Chipset:
System Block Diagram

Note: This is a general block diagram. Please see Chapter 5 for details.


#0-6
#0-5
#0-4
#0-3
#0-2
#0-1
DDR3
800/1066/1333
Processor1
QPI
Processor2
#1-6
#1-5
#1-4
#1-3
#1-2
#1-1
DDR3
800/1066/1333
QPI
QPI
CSI1
CSI0
Slot2
PCI-E 2.0
x16
PCI-E x4
Ports 1,2
CSI0
QPI
CSI1
Ports 1,2
PCI-E x4
PCI-E 2.0
x8
Slot11
Intel
5520
IOH 36D
Intel
5520
IOH 36D
Slot4
PCI-E 2.0
x16
PCI-Ex16
Ports 7,8,9,10
Ports 7,8,9,10
PCI-E x16
PCI-E 2.0
x16
Slot8
Slot6
PCI-E 2.0
x16
PCI-Ex16
Ports 3,4,5,6
Ports 3,4,5,6
PCI-E x16
PCI-E 2.0
x16
Slot10
ESI
ESI x4
Slot1
PCI-E 1.0
x16
PCI-E x4
ESI
Ports 1, 2, 3, 4
#5
#4
#3
#2
#1
#0
6 FRONT
LAN1
Intel
82574L
PCI-E x1
Port5
SATA2
SATA2
#0~#5
LAN2
Intel
82574L
PCI-E x1
Port6
ICH10R
#9
#8
#7
#6
#5
#4
#3
#2
#1
#0
6 REAR+2 Internal
+ 2 Type A
AUDIO
CONN
ALC888
HD
SPI
BIOS
USB2.0
USB2.0
#0~#9
PCI Slot3
PCI Slot5
PCI 33MHZ
USB
LPC BUS
WPCM450
BMC
SIO
W82527HG
TPM
SLB9635TT
DDR
VGA1
Mouse
Keyboard
COM1
External
COM2
External/SOL
Third LAN
RTL8201N
IPMI
LAN

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Email: support@supermicro.com.tw
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Chapter 2

System Setup

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 7046GT-TRF/7046GT-TRF-TC4 up and running. Following the steps in the order given should enable you to have the system operational within a minimal amount of time. If your system is not already fully integrated with a motherboard, processor, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperServer 7046GT-TRF/7046GT-TRF-TC4 was shipped in and note if it was damaged in any way. If the server itself shows damage, you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for setting up and operating the SuperServer 7046GT-TRF/7046GT-TRF-TC4. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet.

Warnings and Precautions!

- Review the electrical and general safety precautions in Chapter 4.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the power supply units and Serial ATA drives to cool before touching them.
- To maintain proper cooling, always keep all chassis panels closed when not being serviced.

2-3 Setting Up the System

You should first open the left side panel (when facing the front of the chassis) to make sure the motherboard is properly installed and all connections have been made.

Warning: Only qualified service technicians should access the inside of the system. Except for short periods of time, do NOT operate the system without the cover in place. The chassis cover must be in place to allow proper airflow and prevent overheating.

Checking the Motherboard Setup

1. Accessing the inside of the system: Begin by disconnecting the chassis from any power source. (A) Lift up and back on the main cover handle, which secures the cover to the chassis. (B) Lift the main cover off of the chassis. See Chapter 5 for details on Chassis covers and how to remove them.

2. Check the CPU (processor): You may have a processor already installed into the system board. The processor should have its own heatsink attached. See Chapter 5 for instructions on processor installation.

3. Check the system memory: Your system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

4. Installing add-on cards: If desired, you can install up to nine add-on cards to the system. See Chapter 5 for details on installing PCI- add-on cards.

   Note: The SuperServer 7046GT-TRF-TC4 contains four Nvidia C1060 Tesla GPU add-on card modules that occupy many of these add-on card expansion slots.

5. Check all cable connections and airflow: Make sure all power and data cables are properly connected and not blocking the airflow. See Chapter 5 for details on cable connections.

Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the SATA drives have been properly installed and all essential connections have been made.

1. Accessing the peripheral drive bays: To install a component to either of the two 5.25" drive bays, you will need to remove the side chassis cover. See the installation and removal sections for the peripheral drives in Chapter 6.

2. Check the SATA disk drives: Depending upon your system's configuration, your system may have up to four SATA drives already installed. If you need to install or remove an SATA drive, please refer to the appropriate section in Chapter 6.

3. Check the airflow: Cooling air is provided by the chassis fan and the power supply fan. The system component layout was carefully designed to promote sufficient airflow throughout the chassis. Also note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fan. Please keep this in mind when rerouting or adding/removing cables.

4. Supplying power to the system: The last thing you must do is to provide input power to the system. Plug the power cord from the power supply unit into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).

2-4 Preparing for Rack Mounting Setup

The box your chassis was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).

- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

General Server Precautions

- Review the electrical and general safety precautions that came with the components you are adding to your chassis.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug hard drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer’s maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-5 Installing the Chassis onto a Rack

This section provides information on installing the SC747 chassis into a rack unit with the optional 4U 17.2" width rail set (MCP-290-00059-0N). There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

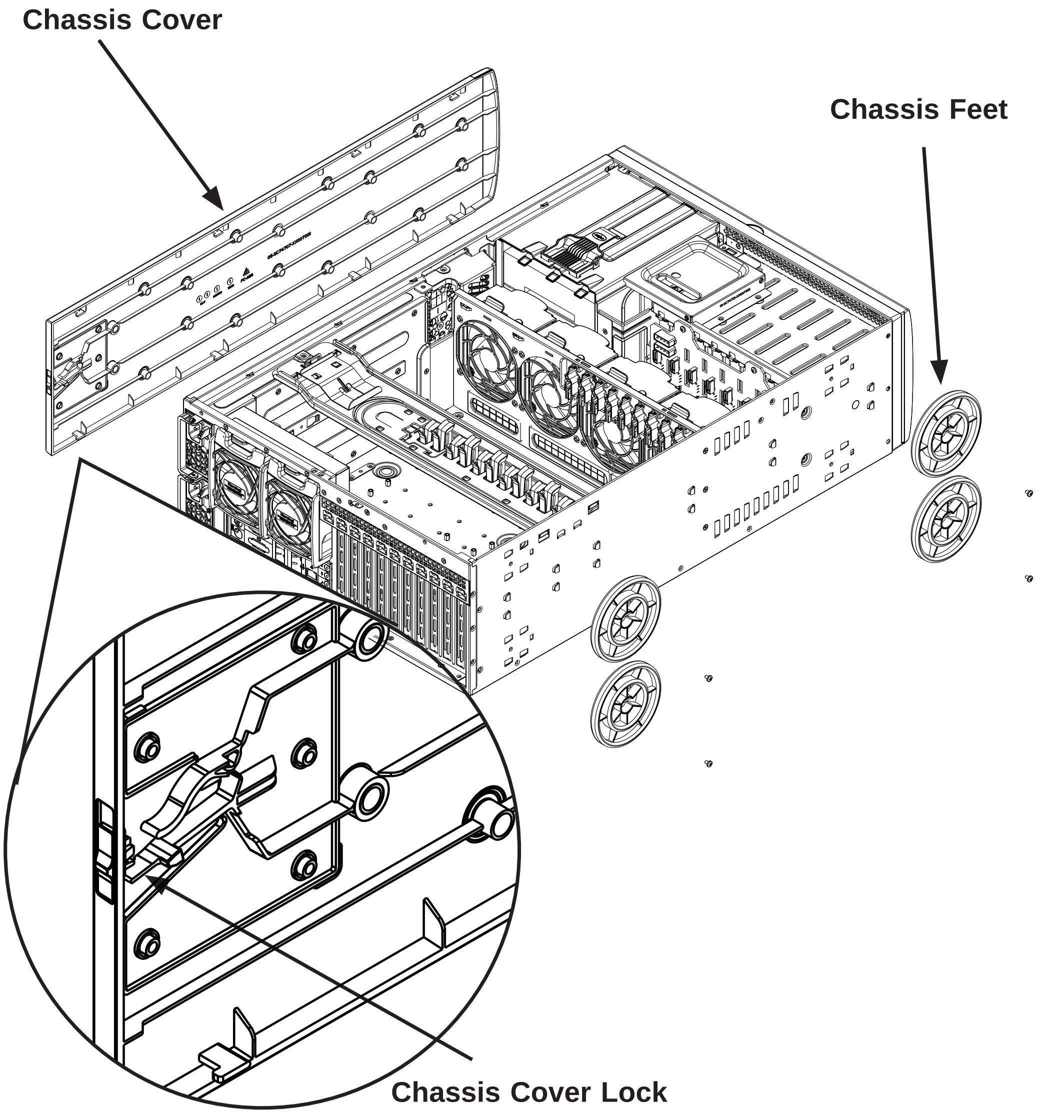
NOTE: The outer rail is adjustable from 26" to 38.25".

NOTE: The MCP-290-00059-0N rail kit is an optional accessory.

Removing the Chassis Cover and Feet

The SC747 chassis is shipped with the chassis cover and feet pre-installed. Both the feet and cover must be removed for before installing the rails.

Figure 6-1: Removing the Feet and Chassis Top Cover



Removing the Chassis Top Cover

1. Locate the chassis cover lock (blue lever) at the rear of the chassis cover.
2. Slide the chassis cover lock to the right and push chassis cover forward.
3. Lift the chassis top cover off the chassis.

Removing the Chassis Feet

1. Place the chassis on its side with the chassis side cover facing upward.
2. Remove the screw holding the chassis foot in place.
3. The foot lock is a tab located in the center of the foot that prevents the foot from sliding. Using a flat head screwdriver, **gently** lift the foot lock upward and slide the foot toward the rear of the chassis.
4. Repeat steps 2 and 3 with each remaining foot.

Identifying the Sections of the Rack Rails

The chassis package includes two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.

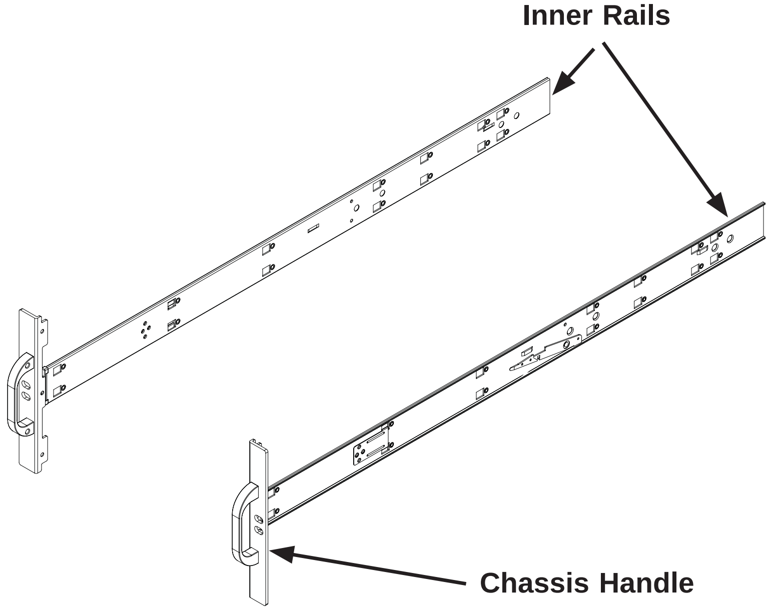


Figure 6-2: Identifying the Inner Rails and Chassis Handles

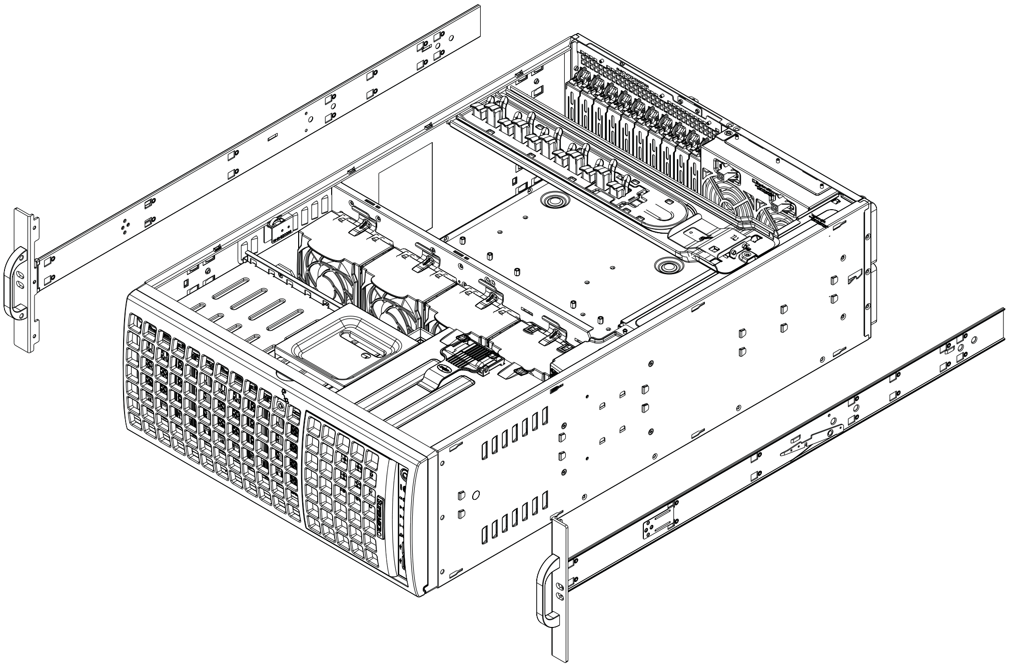


Figure 6-3: Installing the Inner Rack Rails

Installing the Chassis Handles and Inner Rails

Installing the Inner Rails

1. Locate the chassis handles and handle screws.

2. Align the chassis handle with the front of the chassis and secure with the three chassis handle screws.

3. Repeats steps 1 and 2 with the other handle.

4. Locate the inner rails and screws in the shipping package.

5. Align the inner rails against the chassis, as shown. Confirm that the rails are flushed against the edge of the chassis.

6. Tighten the screws. Do not over-tighten.

7. Repeat steps 5 and 6 with the other inner rail.

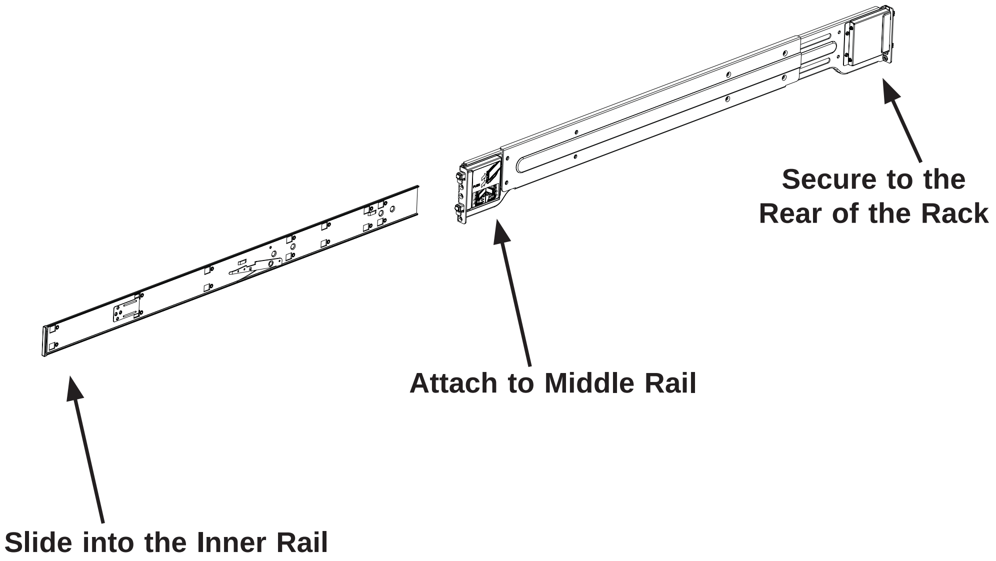

Secure to the
Rear of the Rack
Attach to Middle Rail
Slide into the Inner Rail

Figure 6-4: Assembling the Outer Rails

Installing the Outer Rails to the Rack

Installing the Outer Rails

1. Attach the rear bracket to the middle bracket.

2. Adjust both the brackets to the proper distance so that the rail fits snugly into the rack.

3. Secure the rear of the outer rail with two M5 screws and the rear of the rack. **NOTE:** The outer rail is adjustable from approximately 26" to 38.25".

4. Repeat steps 1-3 for the left outer rail.

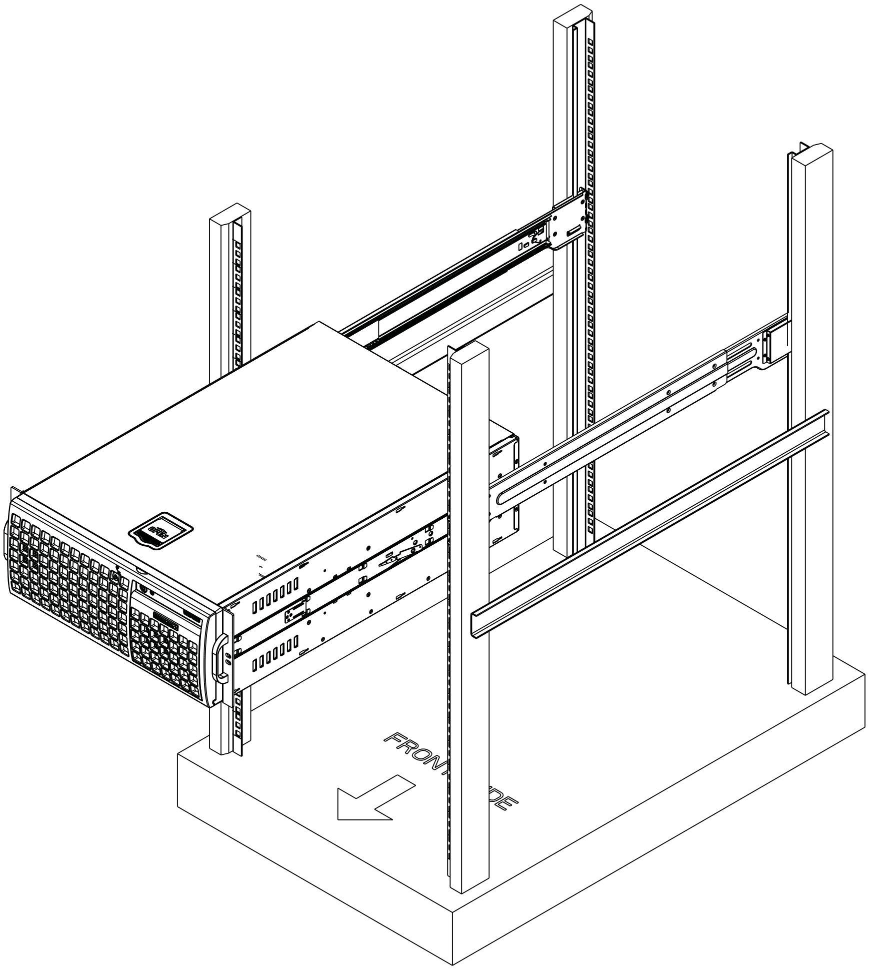


Figure 6-5: Installing the Rack Rails

Installing the Chassis into a Rack

Installing the Chassis

1. Confirm that chassis includes the inner rails and the outer rails.

2. Align the inner chassis rails with the front of the outer rack rails (C).

3. Slide the inner rails into the outer rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). When the chassis has been pushed completely into the rack, you should hear the locking tabs "click" into the locked position.

2-6 Tower Mounting Instructions

The SC747 chassis is shipped with the chassis cover and feet pre-installed. To use the chassis as a desktop server, no other installation is required.

Use the instructions in this section if you have converted the chassis for rack use and need to return the chassis to tower mounting.

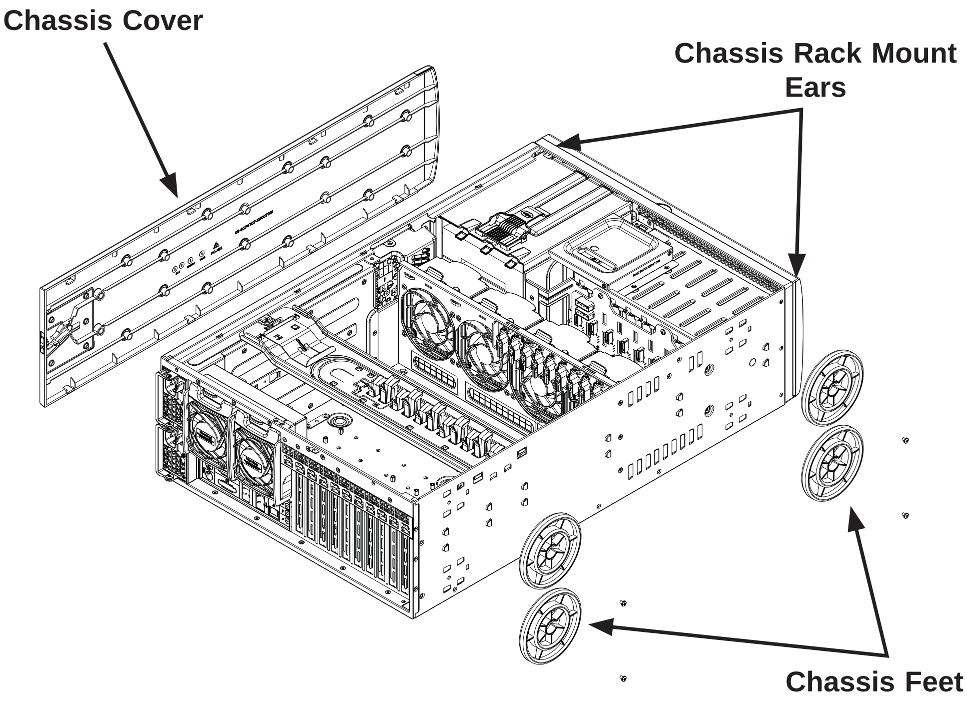


Figure 6-6: Adding Chassis Feet and Top Cover

Installing the Chassis Cover

Installing the Cover

1. Remove the rack mount ears.
2. Align the cover post with the corresponding holes on the top of the chassis and place the cover on top of the chassis. The cover should overhang approximately one-half inch over the front of the chassis.
3. Slide the chassis cover toward the rear of the chassis to lock the cover into place.

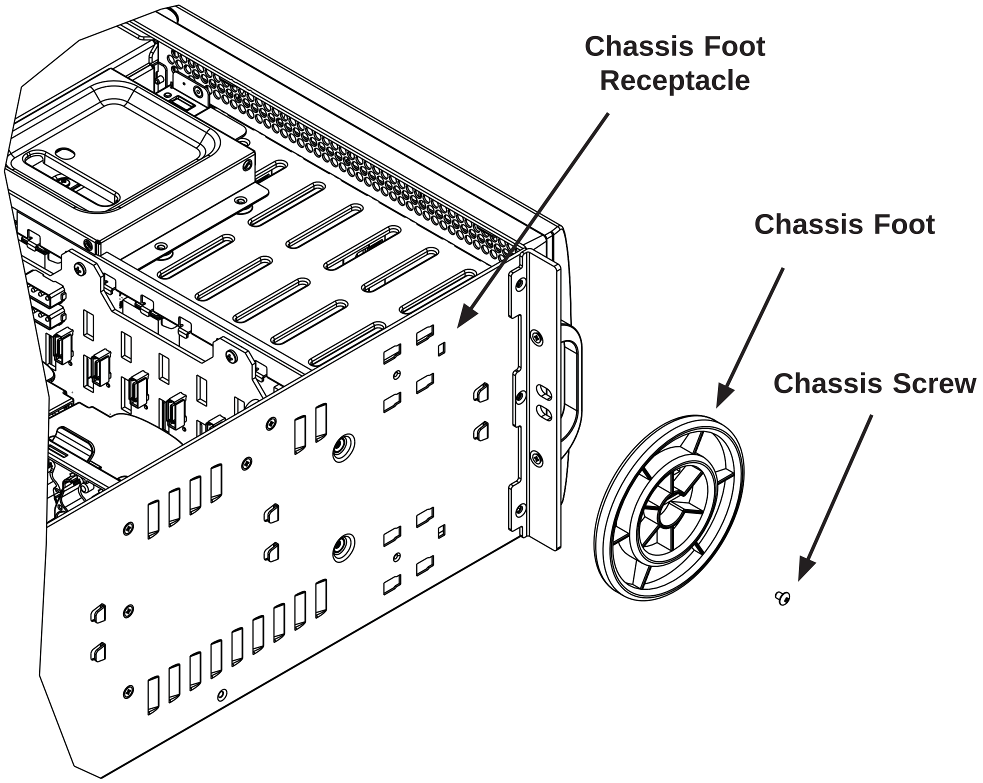

Chassis Foot Receptacle
Chassis Foot
Chassis Screw

Figure 6-7: Placing Chassis Feet

Installing Feet on the Chassis

Installing the Chassis Feet

1. Place the chassis foot in the foot receptacle and slide the foot toward the front of the chassis. The foot should lock into place.
2. Secure the foot to the chassis using one screw enclosed in the packaging.
3. Repeat steps 1 and 2 for the remaining three chassis fee

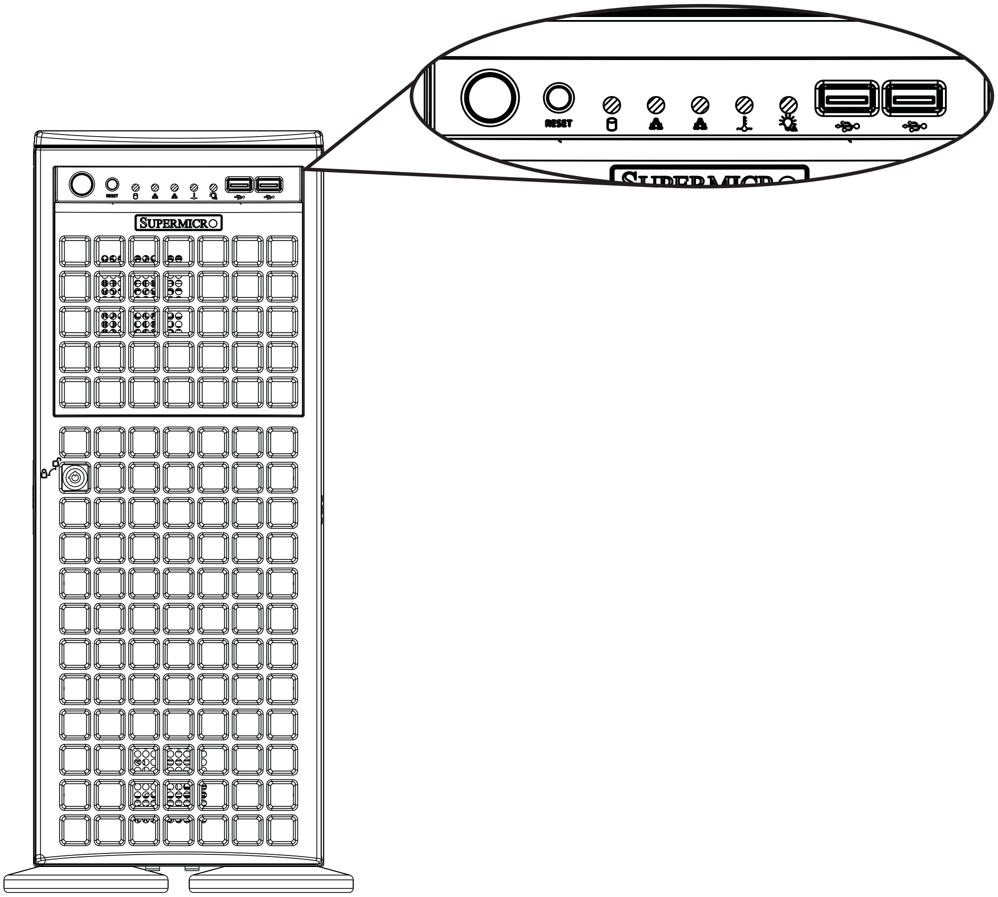
Chapter 3

System Interface

3-1 Overview

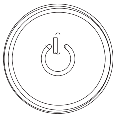
There are several LEDs on the control panel as well as others on the drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. Most SC747 models are two buttons on the chassis a control panel: a reset button and an on/off switch. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

Figure 4-1: Front LEDs

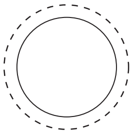


3-2 Control Panel Buttons

There are two push-buttons located on the front of the chassis. These are power on/off button and a reset button.



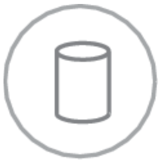
- **Power:** The main power switch is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system. Therefore, you must unplug system before servicing.



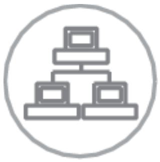
- **Reset:** The reset button is used to reboot the system.

3-3 Control Panel LEDs

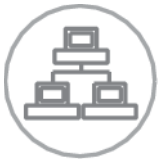
The control panel located on the front of the SC747 chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.



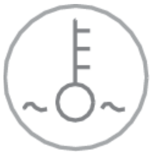
- **HDD:** Indicates IDE channel activity. SAS/SATA drive, SCSI drive, and/or DVD-ROM drive activity when flashing.



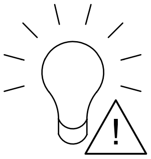
- **NIC1:** Indicates network activity on GLAN1 when flashing.



- **NIC2:** Indicates network activity on GLAN2 when flashing.



- **Overheat/Fan Fail:** When this LED flashes it indicates a fan failure. When continuously on (not flashing) it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly. This LED will remain flashing or on as long as the overheat condition exists.



- **Power Fail:** Indicates a power failure to the system's power supply units.

3-4 Drive Carrier LEDs

Your chassis uses SAS/SATA drives.

SAS/SATA Drives

Each SAS/SATA drive carrier has two LEDs.

- Green: Each Serial ATA drive carrier has a green LED. When illuminated, this green LED (on the front of the SATA drive carrier) indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.

- Red: The red LED to indicate an SAS/SATA drive failure. If one of the SAS/SATA drives fail, you should be notified by your system management software.

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 7046GT-TRF/7046GT-TRF-TC4 from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and floppy drive. When disconnecting power, you should first power down the operating system first and then unplug the power cords. The unit has more than one power supply cord. Disconnect two power supply cords before servicing to avoid electrical shock.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- This product may be connected to an IT power system. In all cases, make sure that the unit is also reliably connected to Earth (ground).

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- DVD-ROM Laser: **CAUTION** - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2 General Safety Precautions

⚠

Follow these rules to ensure general safety:

- Keep the area around the 7046GT-TRF/7046GT-TRF-TC4 clean and free of clutter.

- The 7046GT-TRF/7046GT-TRF-TC4 weighs approximately 72 lbs (32.7 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions

⚠

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.

- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

- Touch a grounded metal object before removing the board from the antistatic bag.

- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

- When handling chips or modules, avoid touching their pins.

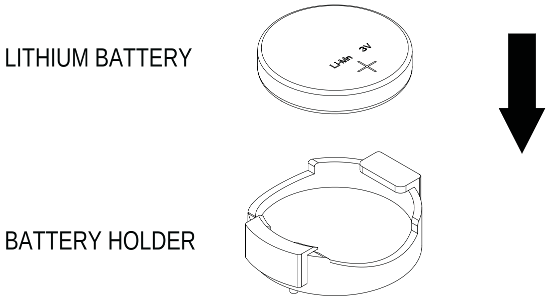
- Put the serverboard and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 7046GT-TRF/7046GT-TRF-TC4 is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install the X8DTG-QF serverboard into the chassis, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the serverboard to better cool and protect the system.

5-1 Handling the Serverboard

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

- Use a grounded wrist strap designed to prevent Electrostatic Discharge (ESD).
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

The serverboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.

5-2 Serverboard Installation

This section describes how to install the serverboard into the SC747 chassis system.

Warning: To avoid damaging the serverboard and its components, do not apply any force greater than 8 lbs. per square inch when installing a screw into a mounting hole.

I/O Slot Shield Installation

The I/O shield holds the motherboard ports in place. Install the I/O shield before you install the motherboard.

Installing the I/O shield:

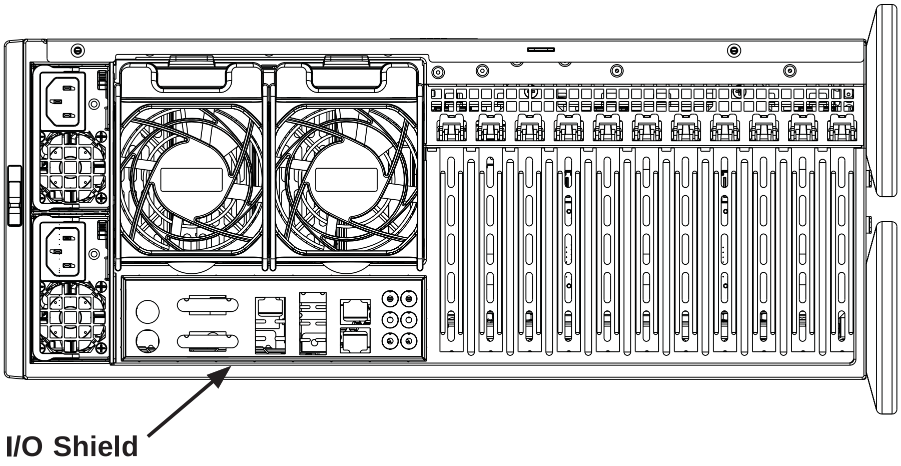
1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, and precautions.

2. Open the chassis cover.

3. Choose the proper I/O shield for the motherboard you are installing.

4. With the illustrations facing the outside of the chassis, place the shield into the space provided. Once installed, the motherboard ports will hold the I/O shield in place.

Figure 5-1: SC747 Chassis I/O Shield



5-3 Connecting Cables

Now that the serverboard is installed, the next step is to connect the cables to the board. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-9 for connector locations.)

- SATA drive data cables (SATA0 ~ SATA5)
- SGPIO cable (T-SGP101, TSGPIO2)
- Control Panel cable (JF1)

Important! Make sure the the cables do not come into contact with the fans.

Connecting Power Cables

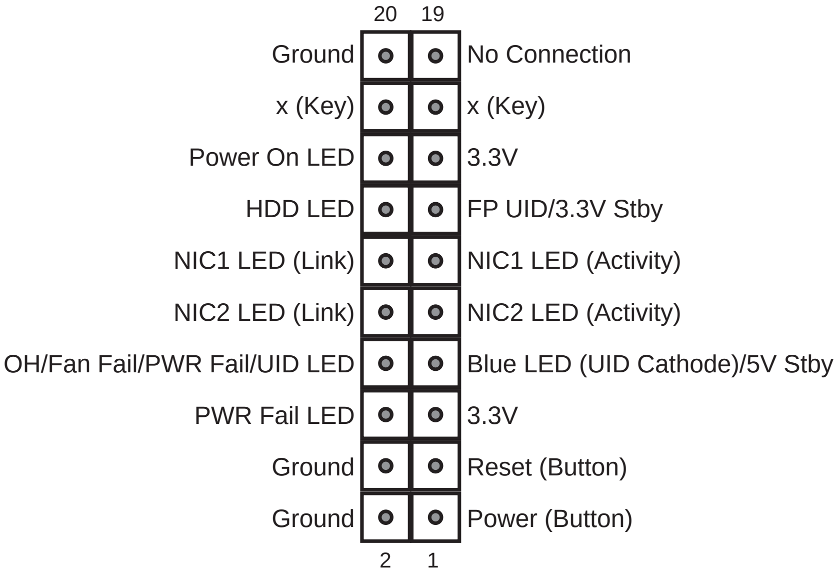
The X8DTG-QF has a 24-pin proprietary power supply connector (JPW1) for connection to the ATX power supply. In addition, there are two 8-pin secondary power connectors (JPW2, JPW3) that also must be connected to your power supply. See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-4 for the pin locations of the various front control panel buttons and LED indicators.

All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See below for details and pin descriptions.

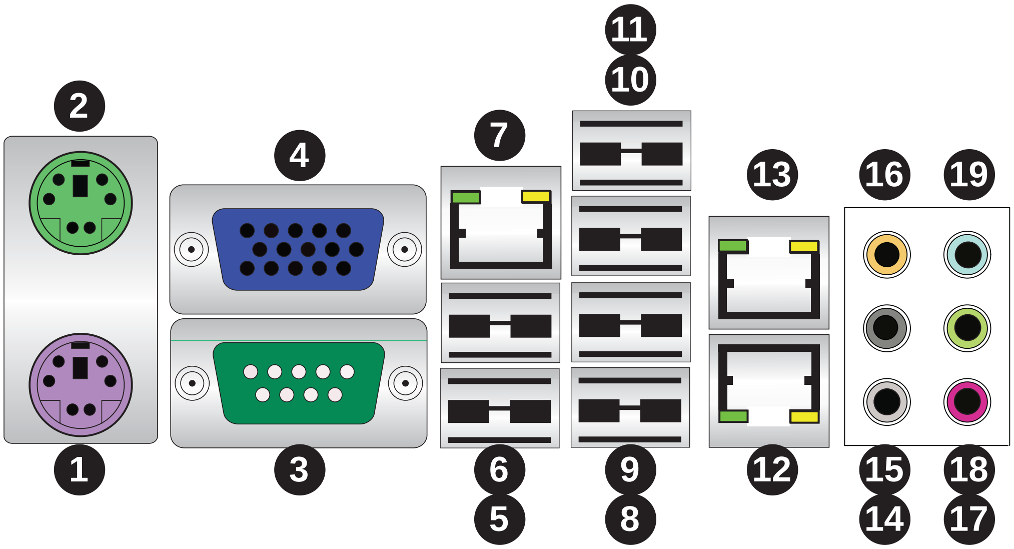
Figure 5-4. Control Panel Header Pins


20
19
Ground
No Connection
x (Key)
x (Key)
Power On LED
3.3V
HDD LED
FP UID/3.3V Stby
NIC1 LED (Link)
NIC1 LED (Activity)
NIC2 LED (Link)
NIC2 LED (Activity)
OH/Fan Fail/PWR Fail/UID LED
Blue LED (UID Cathode)/5V Stby
PWR Fail LED
3.3V
Ground
Reset (Button)
Ground
Power (Button)
2
1

5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-5 below for the colors and locations of the various I/O ports.

Figure 5-5. I/O Ports


11
10
2
4
7
13
16
19
1
3
6
5
9
8
12
15
14
18
17

Back Panel Connectors

1. Keyboard (Purple)
2. PS/2 Mouse (Green)
3. COM Port 1 (Turquoise)
4. VGA (Blue)
5. USB 0
6. USB1
7. IPMI_Dedicated LAN
8. USB 2
9. USB 3
10. USB 4
11. USB 5
12. LAN 2
13. LAN 1
14. Side_surround
15. Back_surround
16. CEN/LFE
17. Microphone_In
18. Front
19. Line_In

5-5 Installing the Processor and Heatsink

Warning: Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

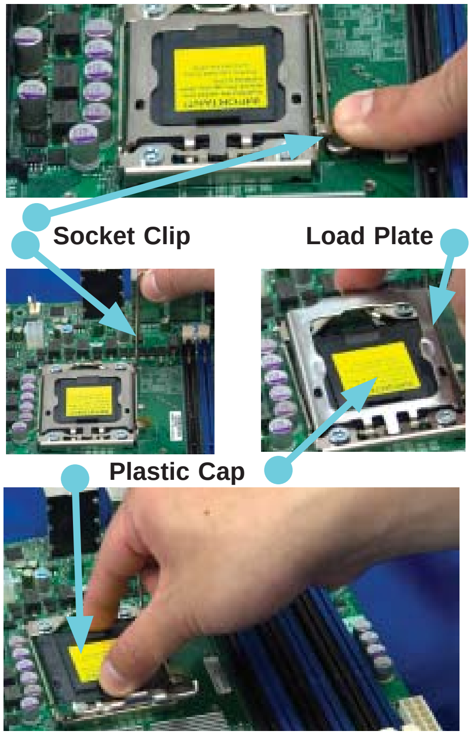
Notes:

- Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.
- If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.
- Make sure to install the serverboard into the chassis before you install the CPU heatsinks.
- When receiving a serverboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.
- Refer to the Supermicro web site for updates on CPU support.

Installing an LGA1366 Processor

1. Press the socket clip to release the load plate, which covers the CPU socket, from its locked position.
2. Gently lift the socket clip to open the load plate.
3. Hold the plastic cap at its north and south center edges to remove it from the CPU socket.

Note: The photos on this page and succeeding pages are for illustration purposes only. They do not necessarily reflect the exact product(s) described in this manual.



Holding the north & south edges

1. After removing the plastic cap, use your thumb and the index finger to hold the CPU at the north and south center edges.

2. Align the CPU key (the semi-circle cutout) with the socket key (the notch below the gold color dot on the side of the socket).

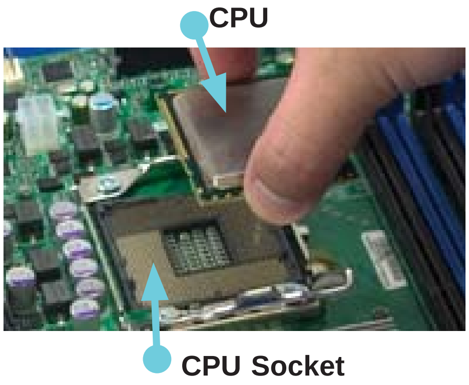
3. Once the CPU and the socket are aligned, carefully lower the CPU straight down into the socket. Do not rub the CPU against the surface of the socket or its pins to avoid damaging the CPU or the socket.

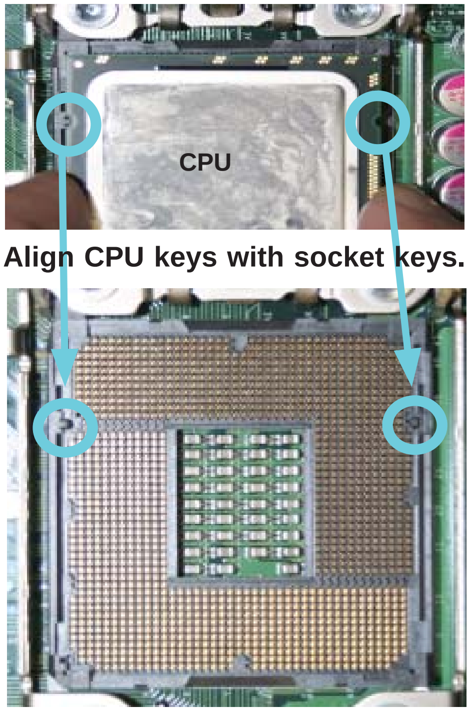
4. With the CPU in the socket, inspect the four corners of the CPU to make sure that it sits level and is properly installed.

5. Once the CPU is securely seated in the socket, lower the CPU load plate to the socket.

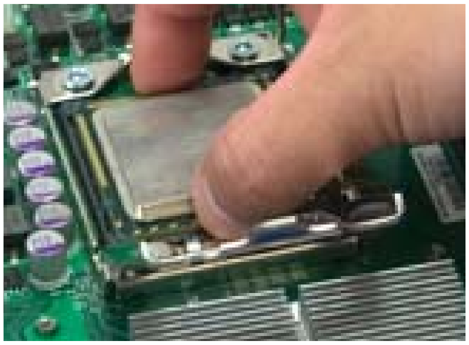
6. Use your thumb to gently push the socket clip down to the clip lock.

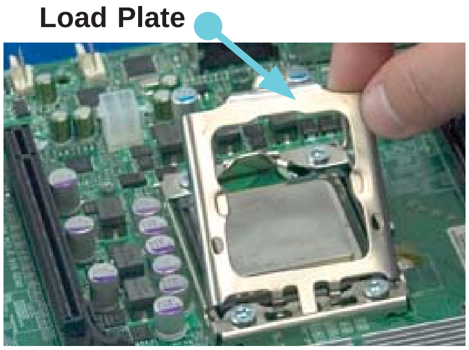
Important! Please save the plastic cap. The serverboard must be shipped with the plastic cap properly installed to protect the CPU socket pins. Shipment without the plastic cap properly installed may cause damage to the socket pins.





Align CPU keys with socket keys.



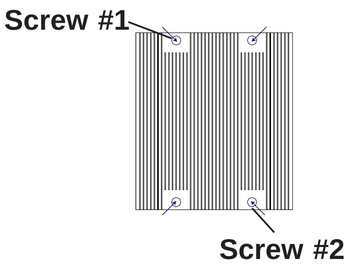


Installation and Removal of the Heatsink

Installing the Heatsink

1. Do not apply any thermal grease to the heatsink or the CPU die; the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.



3. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug (do not over-tighten the screws, which may damage the CPU.)

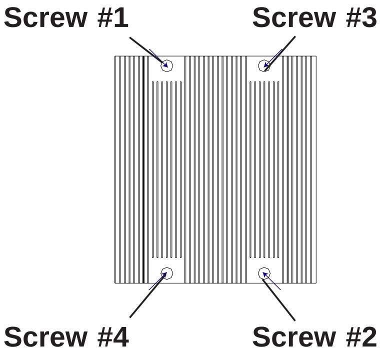
4. Finish the installation by fully tightening all four screws.

Uninstalling the Heatsink

Warning: We do not recommend removing the CPU or the heatsink. However, if you do need to uninstall the heatsink, please follow these instructions to avoid damaging the CPU or the CPU socket.

1. Unscrew and remove the heatsink screws in the sequence shown in the picture on the right.

2. Hold the heatsink as shown in the picture on the right and gently wriggle to loosen it from the CPU. (Do not use excessive force when doing this!)



3. Once the heatsink is loosened, remove it from the CPU socket.

4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease before you re-install the heatsink.

5-6 Installing Memory

CAUTION! Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

Memory Support

The X8DTG-QF supports up to 96 GB of registered ECC or up to 24 GB of unbuffered ECC/non-ECC DDR3-1333/1066/800 MHz SDRAM in 12 DIMM slots. See the following table for memory installation.

Notes: With unbuffered ECC/non-ECC memory, 2 GB is the maximum DIMM size that can be supported per slot.

Memory speed support is dependent on the type of CPU used on the board.

Installing Memory Modules

1. Insert the desired number of DIMMs into the memory slots, starting with P1-DIMM 1A. For best memory performance, please install memory modules of the same type and same speed on the memory slots as indicated on the tables below.

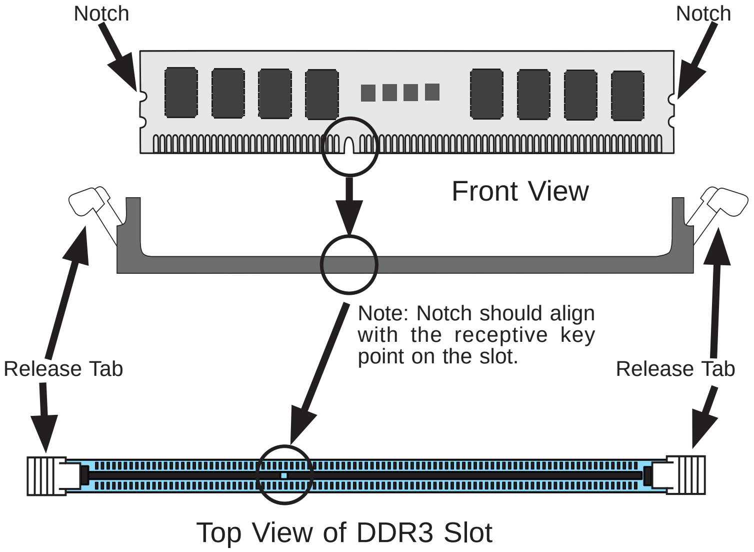
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to avoid installing incorrectly (see Figure 5-6).

3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.

Figure 5-6. DIMM Installation

To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

To Remove:
Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.



Note: Notch should align with the receptive key point on the slot.

Memory Population for Optimal Performance
-For a motherboard with One CPU (CPU1) installed

O	Branch 0		Branch 1		Branch 2	
3 DIMMs	P1 DIMM1A		P1 DIMM2A		P1 DIMM3A	
6 DIMMs	P1 DIMM1A	P1 DIMM1B	P1 DIMM2A	P1 DIMM2B	P1 DIMM3A	P1 DIMM3B

Memory Population for Optimal Performance
-For a motherboard with One CPU (CPU2) installed

	Branch 0		Branch 1		Branch 2	
3 DIMMs	P2 DIMM1A		P2 DIMM2A		P2 DIMM3A	
6 DIMMs	P2 DIMM1A	P2 DIMM1B	P2 DIMM2A	P2 DIMM2B	P2 DIMM3A	P2 DIMM3B

Memory Population for Optimal Performance
-For a motherboard with Two CPUs installed

	CPU1						CPU2					
	Branch 0		Branch 1		Branch 3		Branch 0		Branch 1		Branch 3	
6 DIMMs	1A		2A		3A		1A		2A		3A	
12 DIMMs	1A	1B	2A	2B	3A	3B	1A	1B	2A	2B	3A	3B

Memory Support

The X8DTG-QF supports up to 96 GB of Registered ECC or up to 48 GB of Unbuffered ECC/Non-ECC DDR3 1333/1066/800 MHz Memory in 12 DIMMs.

Note1: For Unbuffered ECC/Non-ECC memory, maximum of 4 GB per DIMM is supported.

Note 2: Memory speed support is dependent on the type of CPU used on the board.

DIMM Module Population Configuration

For memory to work properly, follow the tables below for memory installation:

DIMM Population Table

DIMM Slots per Channel	DIMMs Populated per Channel	DIMM Type (Reg.= Registered)	Speeds (in MHz)	Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)
2	1	Reg. DDR3 ECC	800,1066,1333	SR or DR
2	1	Reg. DDR3 ECC	800,1066	QR
2	2	Reg. DDR3 ECC	800,1066	Mixing SR, DR
2	2	Reg. DDR3 ECC	800	Mixing SR, DR,QR

Note 1: Due to OS limitations, some operating systems may not show more than 4 GB of memory.

Note 2: Due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional.

Possible System Memory Allocation & Availability

System Device	Size	Physical Memory Available (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99 GB
Local APIC	4 KB	3.99 GB
Area Reserved for the chipset	2 MB	3.99 GB
I/O APIC (4 Kbytes)	4 KB	3.99 GB
PCI Enumeration Area 1	256 MB	3.76 GB
PCI Express (256 MB)	256 MB	3.51 GB
PCI Enumeration Area 2 (if needed) -Aligned on 256-M boundary-	512 MB	3.01 GB
VGA Memory	16 MB	2.85 GB
TSEG	1 MB	2.84 GB
Memory available for the OS & other applications		2.84 GB

5-6 Adding PCI Add-On Cards

The SuperServer 7046GT-TRF can support four PCI-E Gen. 2.0 x16 cards (in Slot 4, Slot 6, Slot 8 and Slot 10), one PCI-E Gen. 2.0 x4 (in x16) card (Slot 2), one PCI-E 2.0 x4 (in x8) card (Slot 11), one PCI-E Gen. 1.0 x4 (in x16) card (Slot 1) and two PCI 33 MHz cards (Slot 3, Slot 5) for a total of nine (9) PCI expansion cards.

The SuperServer 7046GT-TRF-TC4 can (in addition to the four preinstalled dougle-width NVIDIA Tesla GPU cards) supports one PCI-E Gen. 2.0 x4 (in x16) card (Slot 2) and one PCI-E Gen. 1.0 x4 (in x16) card (Slot 1).

Installing an Add-on Card

1. Locate the release tab on the top of the PCI slot bracket.

2. Gently apply pressure in the middle of the release tab to unlock the PCI slot bracket.

3. Pull the release tab upward.

Figure 5-7: Add-on Card/Expansion Card Port

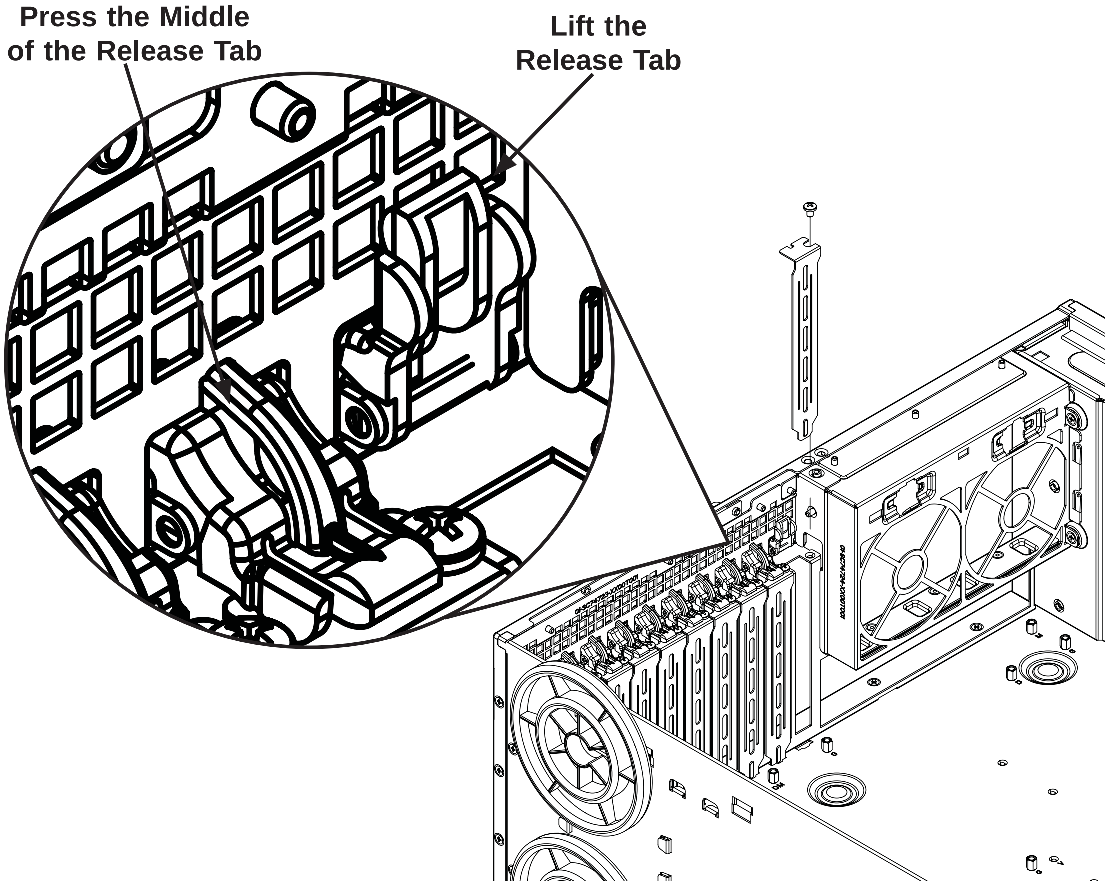
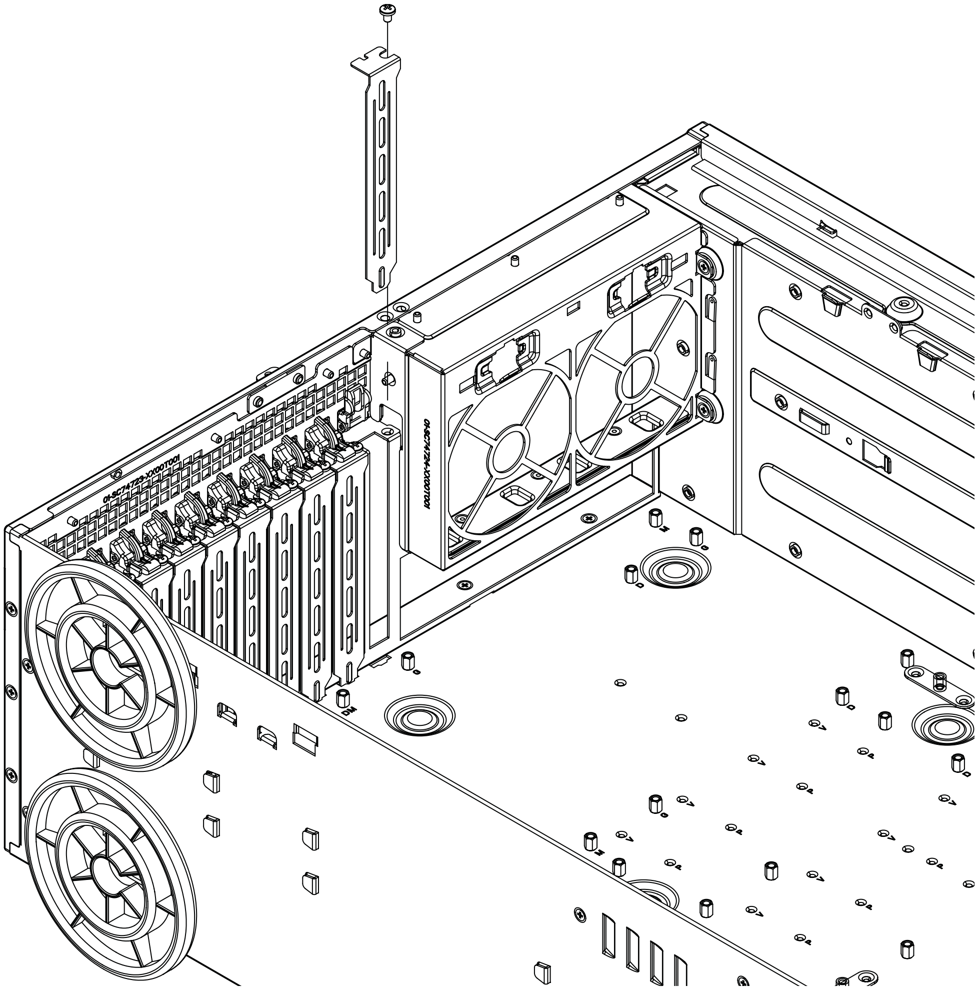


Figure 5-8: Removing the PCI Card Slot Guard



4. Remove the screw holding the bracket in place and pull the bracket from the chassis.

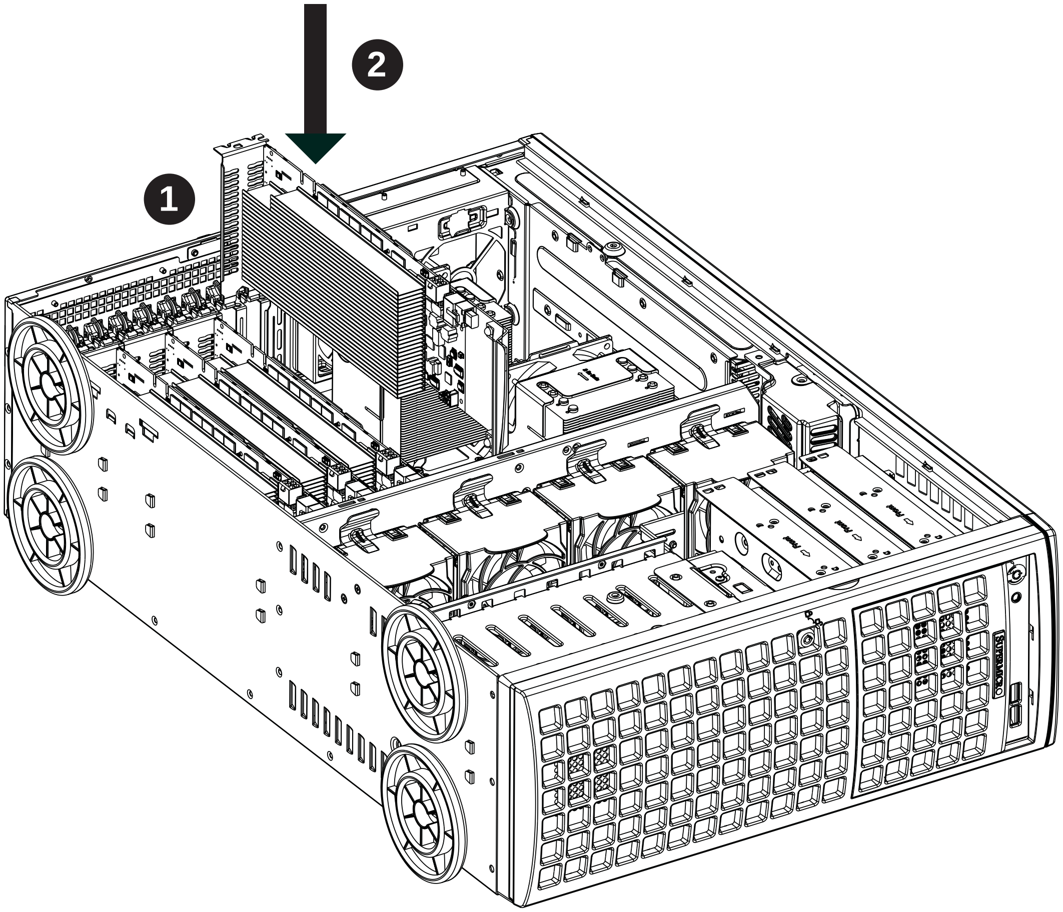
5. Install your PCI card or other add-on card into the PCI slot bracket and motherboard. To do this, slide the PCI card (with "L" bracket) into the PCI slot and secure the card to the motherboard.

6. Push the PCI bracket release tab down until it locks into place with an audible "click".

7. Secure the PCI card with the screw previously removed from the chassis.

8. Repeat this process with each PCI card you want to install into the chassis.

Figure 5-9: Installing Graphics Cards



Installing Double-Width Graphics Cards

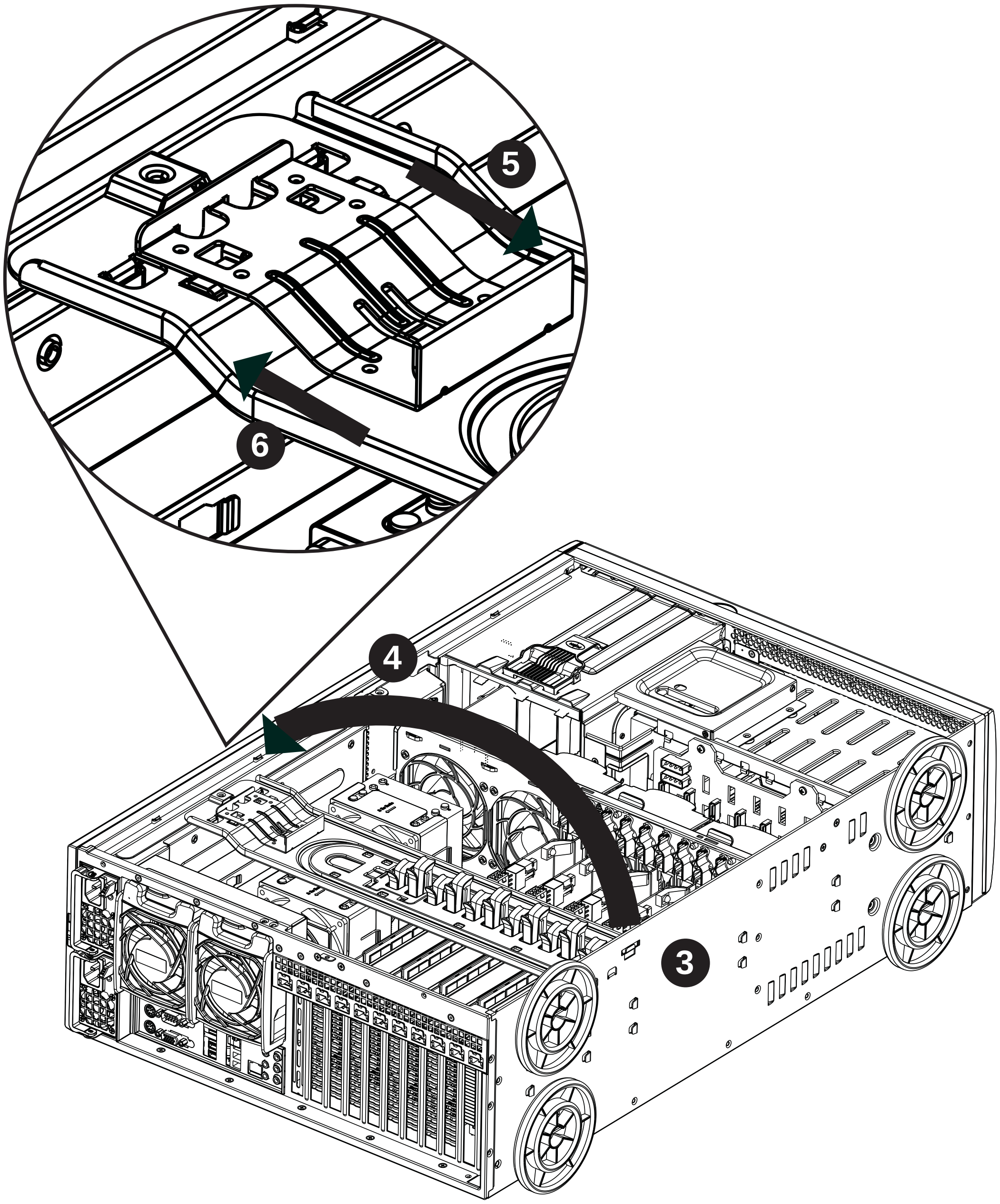
The SC747 chassis is designed to support up to four double-width, high-end graphics cards. A (part number) bracket is recommended for this application and may be purchased by visiting the Supermicro Web site at http://www.supermicro.com and clicking on the Where to Buy link.

Installing Double-Width Graphics Cards

1. Insert the graphics card into the appropriate add-on card slot (Figure 5-9)

2. Slide the graphics card down onto the motherboard.

Figure 5-10: Closing the Graphics Card Bracket



3. Place the tabs of the (part number) graphics card bracket into the slots on the wall of the chassis as illustrated in Figure 5-10.

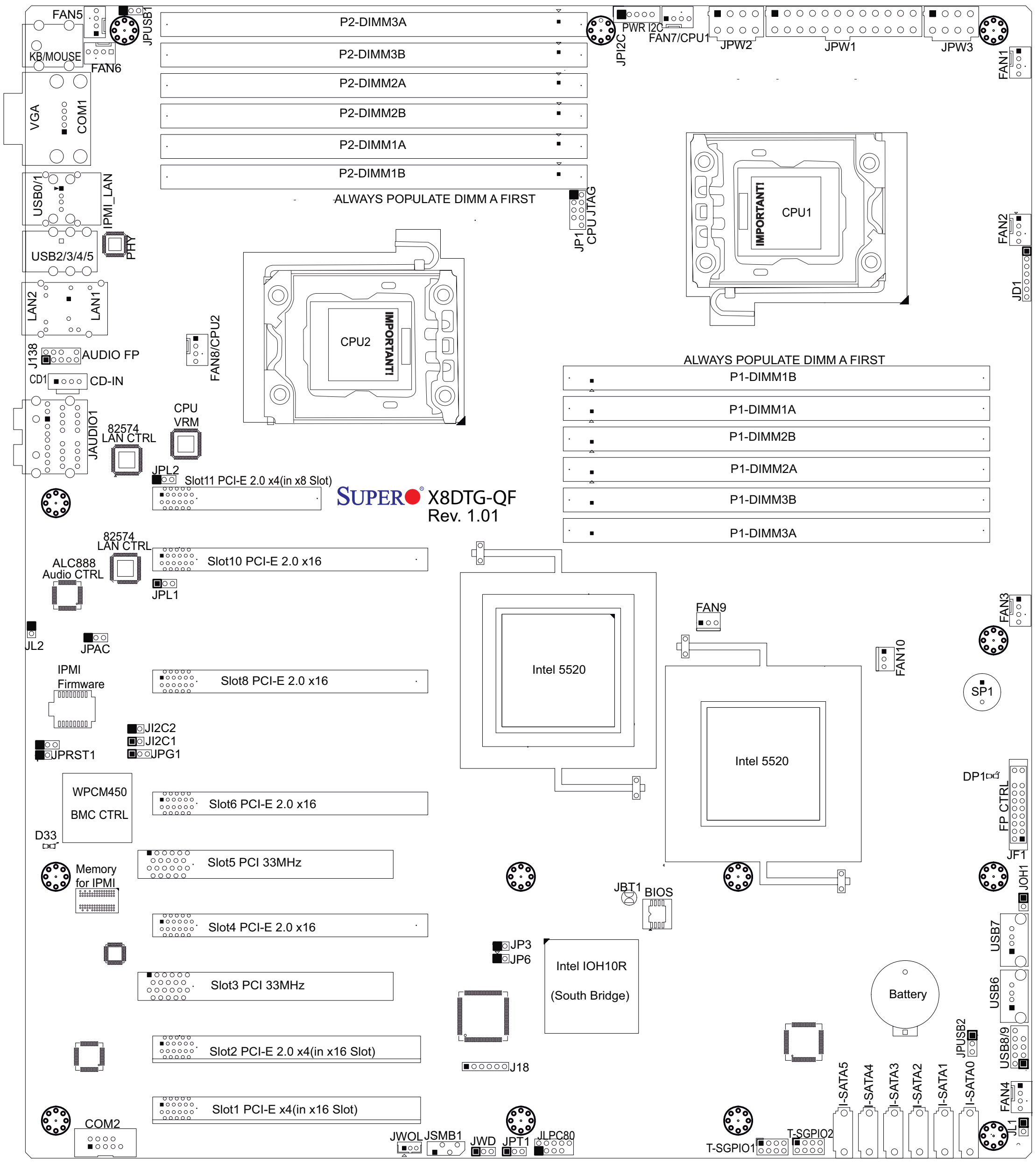
4. Lower the bracket down onto the card

5. Pull back the slide lock and lower it over the raised tab as illustrated.

6. Push the slide lock forward, allowing the pins of the slide lock to penetrate the thru holes in the raised tab.

5-7 Serverboard Details

Figure 5-11. X8DTG-QF Layout
(not drawn to scale)


FAN5
JPUSB1
KB/MOUSE
FAN6
VGA
COM1
USB0/1
IPMI_LAN
USB2/3/4/5
PHY
LAN2
LAN1
J138
AUDIO FP
CD1
CD-IN
JAUDIO1
82574
LAN CTRL
CPU
VRM
JPL2
Slot11 PCI-E 2.0 x4(in x8 Slot)
82574
LAN CTRL
ALC888
Audio CTRL
Slot10 PCI-E 2.0 x16
JPL1
JL2
JPAC
IPMI
Firmware
Slot8 PCI-E 2.0 x16
JI2C2
JI2C1
JPG1
JPRST1
WPCM450
BMC CTRL
D33
Slot6 PCI-E 2.0 x16
Memory
for IPMI
Slot5 PCI 33MHz
Slot4 PCI-E 2.0 x16
Slot3 PCI 33MHz
Slot2 PCI-E 2.0 x4(in x16 Slot)
Slot1 PCI-E x4(in x16 Slot)
COM2
P2-DIMM3A
P2-DIMM3B
P2-DIMM2A
P2-DIMM2B
P2-DIMM1A
P2-DIMM1B
ALWAYS POPULATE DIMM A FIRST
JP1
CPU JTAG
FAN8/CPU2
CPU2
IMPORTANT!
JPI2C
PWR I2C
FAN7/CPU1
JPW2
JPW1
JPW3
FAN1
CPU1
IMPORTANT!
FAN2
JD1
ALWAYS POPULATE DIMM A FIRST
P1-DIMM1B
P1-DIMM1A
P1-DIMM2B
P1-DIMM2A
P1-DIMM3B
P1-DIMM3A
SUPER
X8DTG-QF
Rev. 1.01
FAN3
FAN9
FAN10
Intel 5520
Intel 5520
SP1
DP1
FP CTRL
JF1
JOH1
JBT1
BIOS
JP3
JP6
Intel IOH10R
(South Bridge)
Battery
USB7
USB6
JPUSB2
USB8/9
J18
I-SATA5
I-SATA4
I-SATA3
I-SATA2
I-SATA1
I-SATA0
FAN4
JL1
T-SGPIO2
T-SGPIO1
JWOL
JSMB1
JWD
JPT1
JLPC80

Notes:

1. Jumpers not indicated are for test purposes only. For more information on jumpers or components, refer to Chapter 2.

2. " " indicates the location of Pin 1.

3. When DP1 LED is on, the onboard power connection is on. Make sure to unplug the power cables before removing or installing components.

X8DTG-QF Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	(See Section 2-8)
JI2C1/JI2C2	SMB to PCI/PCI-E Slots	Open/Open (Disabled)
JL2	Audio Mode Select	Open (HD Mode)
JPAC	Audio Enable	Pins 1-2 (Enable)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPL1/JPL2	LAN1/2 Enable	Pins 1-2 (Normal)
JPRST1	Alarm Reset Enable	Open (Enabled)
JPT1	TPM Support Enable	Pins 1-2 (Enabled)
JPUSB1	Back USB Wake-up Enable	Pins 1-2 (Enabled)
JPUSB2	Front Panel USB Wake-up	Pins 2-3 (Disabled)
JWD	Watch Dog	Pins 1-2 (Reset)

Connector	Description
(HD) Audio/CD-In/FP Audio	7.1 Channel High Definition Audio (JAUDIO1)/CD-In (CD-1)/Front Panel Audio (J138)
COM1/COM2	COM1 Serial Port/COM2 Serial Port Header
FAN#1~FAN#10	System/CPU Fan Headers (Fans 7~8: CPU Fans)
I-SATA0 ~ I-SATA5	(Intel South Bridge) SATA Ports 0~5
JD1	Power LED (Pins 1~3)/Speaker (Pins 4~7)
JF1	Front Panel Connector
JL1	Chassis Intrusion
JOH1	Overheat LED Indicator
JPW1, JPW2/JPW3	12V 24-pin Main PWR, 12V 8-pin PWR Connectors
JSMB1	System Management Bus (SMBus) I2C Header (J18)
JPI2C	Power System Management Bus (I2C) Connector
JWOL	Wake-On_LAN
KB/Mouse	PS2 Keyboard/Mouse
LAN1/2, IPMI_LAN	Gigabit Ethernet (RJ45) Ports 1~2, IPMI_Dedicated LAN
SP1	Internal Speaker/Buzzer Header
T-SGPIO-0/T-SGPIO-1	Serial General Purpose Input/Output Headers
USB 0/1, USB 2/3/4/5	Backplane Universal Serial Bus (USB) Ports 0/1, 2/3/4/5
USB 6, 7, 8/9	Front Panel USB 6, 7, 8/9
VGA	Video Port

LED	Description
DP1	Onboard Standby PWR warning LED Indicator
D33	BMC LED Indicator

5-8 Connector Definitions

Main ATX Power Supply Connector

The primary power supply connector (JPW1) is a proprietary design. Refer to the table on the right for the pin definitions of this connector. You must also connect the 8-pin (JPW2/JPW3) graphics card power connectors to your power supply (see below).

20-pin Main Power Connector Pin Definitions

Pin#	Definition	Pin #	Definition
11	PS On	1	Ground
12	5VSB	2	Ground
13	Ground	3	Ground
14	Ground	4	Ground
15	Ground	5	Ground
16	NC2	6	NC1
17	12V	7	12V
18	12V	8	12V
19	12V	9	12V
20	12V	10	12V

Graphics Card Power Connectors

JPW2 and JPW3 must also be connected to the power supply to provide power for the GPUs. See the table on the right for pin definitions.

Graphics Card Power Connector Pin Definitions

Pin#	Definition	Pin #	Definition
1	12V	5	Ground
2	12V	6	Ground
3	12V	7	Ground
4	Ground	8	Ground

Required Connection

Notes: For the these proprietary connectors to work properly, please customize your PWR cables based on the SMC PWR Connector Pin-Out Definitions listed in the tables above. For the PCI-Exp. Graphic cards to work properly, connect the PCI-E graphic card power connectors (JPW2/JPW3) to the power supply.

Power Button Connector

The PW_ON connector is on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - see Chapter 4). To turn off the power when set to suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions. This header should be connected to the chassis power button. See the table on the right for pin definitions.

Power Button Pin Definitions (JF1)

Pin#	Definition
1	Power
2	Ground

Reset Connector

The reset connector is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)

Pin#	Definition
3	Reset
4	Ground

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

PWR Fail LED Pin Definitions (JF1)

Pin#	Definition
5	3.3V
6	PWR Fail LED

Overheat/Fan Fail/PWR Fail/UID LED

Connect an LED cable to pins 7 and 8 of JF1 for the Overheat/Fan Fail/Power Fail connections. The red LED (pin 8) provides warning of an overheat, fan failure or power failure. The blue LED (pin 7) works as the UID LED indicator for the front panel UID button located on pins 13~14 of JF1. When Jumper J_UID_OW is set to off (default), the red LED takes precedence over the blue LED. (See Page 2-31 for details.) Refer to the table on the right for pin definitions.

OH/Fan Fail/ PWR Fail/Blue_UID LED Pin Definitions (JF1)

Pin#	Definition
7	Blue_LED-Cathode(UID)/5.5V.SB
8	OH/Fan Fail/PWR Fail/UID LED (Red)

OH/Fan Fail/PWR Fail LED Status (Red LED)

State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail

NIC2 (JLAN2) LED

The LED connections for JLAN2 are on pins 9 and 10 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF1)

Pin#	Definition
9	Vcc
10	Ground

NIC1 (JLAN1) LED

The LED connections for JLAN1 are on pins 11 and 12 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)

Pin#	Definition
11	Vcc
12	Ground

HDD/FP UID Button

The HDD/UID button connections are located on pins 13/14 of JF1. Attach a hard-drive LED cable to display HDD or SATA activity. This connection can also be used for the front panel UID (Unit Identifier) button. (The UID LED on pin 7 of JF1 works in conjunction with the UID button.) When the user presses and releases the UID button, the UID LED will be turned on or off to indicate the location of the unit in a stack or rackmounted servers.

HDD/UID LED Pin Definitions (JF1)

Pin#	Definition
13	UID Signal/3.3V
14	HDD Active

Power On LED

The Power On LED connector is located on pins 15 and 16 of JF1. This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JF1)

Pin#	Definition
15	+3.3V Stby
16	Control

Fan Headers

The X8DTG-QF has ten chassis/system fan headers (Fan1 to Fan10). Fan 7 and Fan 8 are CPU Fans. All these 4-pin fans headers are backward compatible with the traditional 3-pin fans. Fan speed control is available for 4-pin fans but not supported by 3-pin fans. The fan speeds are controlled by Thermal Management via Hardware Monitoring in the Advanced Setting in the BIOS. (The Default setting is disabled.) See the table on the right for pin definitions.

Fan Header Pin Definitions

Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

Universal Serial Bus (USB)

Six Universal Serial Bus ports (USB 0/1, 2/3/4/5) are located on the I/O back panel. Additional four USB connections (USB 6, 7, 8/9) are used to provide front chassis access. Connect USB cables to these USB ports/headers to use USB connections. (USB cables are not included). See the tables on the right for pin definitions.

Back Panel USB 0/1, 2/3/4/5 Pin Definitions

Pin#	Definition	Pin#	Definition
1	+5V	5	+5V
2	USB_PN1	6	USB_PN0
3	USB_PP1	7	USB_PP0
4	Ground	8	Ground

Front Panel USB 6,7, 8/9 Pin Definitions

USB 6, 7, 8		USB 9	
Pin#	Definition	Pin#	Definition
1	+5V	6	+5V
2	USB_PN2	7	USB_PN3
3	USB_PP2	8	USB_PP3
4	Ground	9	Ground
5	NC	10	Key

NC = No Connection

Chassis Intrusion

The Chassis Intrusion header is designated JL1. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened

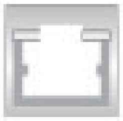
Chassis Intrusion Pin Definitions

Pin#	Definition
1	Intrusion Input
2	Ground

LAN1/2 (Ethernet Ports)

Two Ethernet ports are located next to the USB 2~5 on the IO Backplane. In addition, an IPMI Dedicated LAN is located above the USB ports 0/1. These ports accept RJ45 type cables.

Note: Please refer to the LED Indicator Section for LAN LED information.



LAN Ports Pin Definition

Pin#	Definition	Pin#	Definitions
1	P2V5SB	10	SGND
2	TD0+	11	Act LED
3	TD0-	12	P3V3SB
4	TD1+	13	Link 100 LED (Yellow, +3V3SB)
5	TD1-	14	Link 1000 LED (Yellow, +3V3SB)
6	TD2+	15	Ground
7	TD2-	16	Ground
8	TD3+	17	Ground
9	TD3-	88	Ground

NC = No Connection

Serial Ports

Two COM connections (COM1 & COM2) are located on the motherboard. COM1 is located on the Backplane IO panel. COM2 is header located next to PCI-E Slot 1 to provide additional serial connection support. See the table on the right for pin definitions.

Serial Ports-COM1/COM2 Pin Definitions

Pin#	Definition	Pin#	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground		N/A

Video Connector

A Video (VGA) connector is above COM 1 on the IO backplane. This connector is used to provide video and CRT display. Refer to the board layout for the location.

T-SGPIO Headers

Two SGPIO (Serial-Link General Purpose Input/Output) headers (T-SGPIO-1/T-SGPIO-2) are located on the motherboard. These headers support serial link interfaces for the onboard SATA connectors. See the table on the right for pin definitions. Refer to the board layout below for the location.

SGPIO Header Pin Definitions

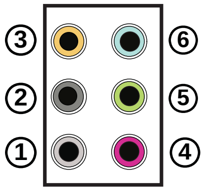
Pin#	Definition	Pin#	Definition
1	NC	2	NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	NC

NC = No Connection

(Back_Panel) High Definition Audio (HD Audio)

This motherboard features a 7.1+2 Channel High Definition Audio (HDA) codec that provides 10 DAC channels. The HD Audio connections simultaneously supports multiple-streaming 7.1 sound playback with 2 channels of independent stereo output for front L&R, rear L&R, center and subwoofer speakers. Use the software included in the CD-ROM with your motherboard to use this feature.

HD Audio



(BP) HD Audio	
Conn#	Signal
1	Side_Surround
2	Back_Surround
3	CEN/LFE
4	Microphone_In
5	Front
6	Line_In

CD & 10-pin Audio Headers

A 4-pin CD header (CD1) and a 10-pin Front Panel Audio header (J138) are also located on the motherboard. These headers allow you to use the onboard sound for audio CD playback. Connect an audio cable from your CD drive to the CD header that fits your cable's connector. See the tables at right for pin definitions for these headers.

CD1 Pin Definition	
Pin#	Definition
1	Left
2	Ground
3	Ground
4	Right

10-in Audio Pin Definitions	
Pin#	Signal
1	Microphone_Left
2	Audio_Ground
3	Microphone_Right
4	Audio_Detect
5	Line_2_Right
6	Ground
7	Jack_Detect
8	Key
9	Line_2_Left
10	Ground

Power LED/Speaker

On JD1 header, pins 1~3 are used for power LED indicator and pins 4~7 are for the speaker. Connect a cable to pins 4~7 of JD1 to use an external speaker. If you wish to use the internal speaker, please close pins 6~7 with a jumper. See the tables on the right for pin definitions.

PWR LED Connector Pin Definitions

Pin Setting	Definition
Pin 1	Anode (+)
Pin2	Cathode (-)
Pin3	NA

Speaker Connector Pin Definitions

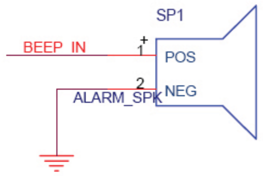
Pin Setting	Definition
Pins 4-7	External Speaker
Pins 6-7	Internal Speaker

Internal Buzzer

The Internal Buzzer, located at SP1, can be used to provide audible alarms for various beep codes. See the table on the right for pin definitions. Refer to the layout below for the locations of the Internal Speaker/Buzzer.

Internal Buzzer Pin Definitions

Pin#	Definitions	
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker



SMB (I^2C) Connector

System Management Bus (I^2C) Connector (JSMB1) monitors power supply, fan and system temperatures. See the table on the right for pin definitions.

PWR SMB Pin Definitions

Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground

Power SMB (I^2C) Connector

Power System Management Bus (I^2C) Connector (JPI^{2}C) monitors power supply, fan and system temperatures. See the table on the right for pin definitions.

PWR SMB Pin Definitions

Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	+3.3V

Overheat LED/Fan Fail (JOH1)

The JOH1 header is used to connect an LED indicator to provide warnings of chassis overheating or fan failure. This LED will blink when a fan failure occurs. Refer to the table on right for pin definitions.

Overheat LED Pin Definitions	
Pin#	Definition
1	5vDC

OH/Fan Fail LED Pin Definitions	
State	Message
Solid	Overheat
Blinking	Fan Fail

Wake-On-LAN

The Wake-On-LAN header is located at JWOL on the motherboard. You must also have a LAN card with a Wake-On-LAN connector and a cable to use this feature. See the table on the right for pin definitions.

Wake-On-LAN Pin Definitions	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on the rear IO panel. The mouse port is above the keyboard port. See the table on the right for pin definitions.

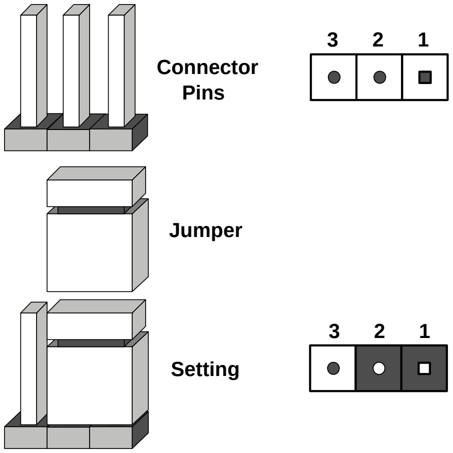
PS/2 Keyboard and Mouse Port Pin Definitions (J14)	
Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

5-9 Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the serverboard layout pages for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.



CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS,

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

Note: *Do not use the PW_ON connector to clear CMOS.*

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings

Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

LAN1/2 Enable/Disable

Change the setting of jumper JPL1/JPL2 to enable or disable the LAN1/LAN2 Ethernet ports on the serverboard. See the table on the right for jumper settings. The default setting is enabled.

LAN1/2 Enable/Disable Jumper Settings

Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Watch Dog Enable/Disable

JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause WD to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Note: When enabled, the user needs to write their own application software in order to disable the Watch Dog Timer.

Watch Dog Jumper Settings

Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

I^{2}C Bus to PCI-Exp. Slots

Jumpers JI^{2}C1 and JI^{2}C2 allow you to connect the System Management Bus (I^{2}C) to PCI and PCI-Express slots. These two jumpers are to be set at the same time. The default setting is Open to disable the connections. See the table on the right for jumper settings.

I^{2}C for PCI/PCI-E slots Jumper Settings

Jumper Setting	Definition
Closed	Enabled
Open	Disabled (Default)

Audio Mode Select

Jumper JL2 allows you to select the Audio mode. You can choose using AC '97 Audio or HD (High-definition) Audio. The default setting is Open to use HD Audio. See the table on the right for jumper settings.

Audio Mode Select Jumper Settings

Jumper Setting	Definition
Closed	AC'97 Panel
Open	HD Audio (Default)

USB Wake-Up

JPUSB1/JPUSB2 jumpers allow you to "wake up" the system by pressing a key on the USB keyboard or by clicking the USB mouse of your system. JPUSB1 is used for Backpanel USB Ports #0~5, and JPUSB2 is for Front Panel USB Ports #6~9. These jumpers are used in conjunction with the USB Wake-Up function in the BIOS. See the table on the right for jumper settings and jumper connections. (JPUSB1: Default: Enabled, JPUSB2: Default: Disabled.)

Backpanel USB Wake-Up Enable (JPUSB1) Jumper Settings

Pin#	Definition
1-2	Enabled (default)
2-3	Disabled

FP USB Wake-up Enable (JPUSB2) Jumper Settings

Pin#	Definition
1-2	Enabled
2-3	Disabled (Default)

Audio Enable

JPAC allows you to enable or disable the onboard audio connection. The default position is on pins 1 and 2 to enable audio support. See the table on the right for jumper settings.

Audio Enable/Disable Jumper Settings (JPG1)

Both Jumpers	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

TPM Support Enable

JPT1 allows the user to enable TPM (Trusted Platform Modules) support to enhance data integrity and system security. See the table on the right for jumper settings. The default setting is enabled. (This feature is available for the OEM only.)`

TPM Enable Jumper Settings

Jumper Setting	Definition
1~2	Enabled (Default)
2~3	Disabled

Alarm Reset

If three power supplies are installed and Alarm Reset (JPRST1) is enabled, the system will notify you when any of the three power modules fails. Connect JPRST1 to a micro-switch to enable you to turn off the alarm that is activated when a power module fails. See the table on the right for jumper settings.

Alarm Reset Jumper Settings

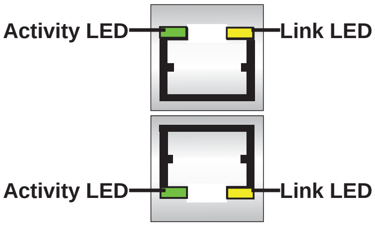
Pin Setting	Definition
Closed	Alarm Reset
Open	Normal

5-10 Onboard Indicators

GLAN LEDs

There are two GLAN ports on the motherboard. An additional IPMI dedicated LAN port is also located above the USB 0/1 ports on the backpanel. Each Gigabit Ethernet LAN port has two LEDs. The yellow LED indicates activity, while the Link LED may be green, amber or off to indicate the speed of the connection. See the tables at right for more information.

Note: IPMI dedicated LAN does not operate at 1 Gbps.



Rear View (when facing
the rear side of the chassis)

GLAN Activity Indicator LED Settings		
Color	Status	Definition
Green	Flashing	Active

GLAN Link Indicator LED Settings	
LED Color	Definition
Off	No Connection or 10 Mbps
Green	100 Mbps
Amber	1 Gbps

Onboard Power LED

An Onboard Power LED is located at DP1 on the motherboard. When this LED is on, the system power is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the tables at right for more information.

Onboard PWR LED Indicator Settings	
LED Color	Definition
Off	System Off (PWR cable not connected)
Green	System On
Green: Flashing	ACPI S1 State

BMC Activity LED

A BMC Heartbeat LED is located at D33 on the motherboard. When D33 is on, BMC (Baseboard Management Controller) is active. See the tables at right for more information.

BMC Activity LED Indicator LED Settings	
Green: Blinking	BMC is active

5-11 SATA Ports

Serial ATA Ports

Six Serial ATA Ports (I-SATA0~I-SATA 5) are located below the onboard battery on the motherboard. These ports, supported by Intel ICH10R (South Bridge), provide serial-link signal transmission, which is faster than that of the traditional Parallel ATA. See the table on the right for pin definitions.

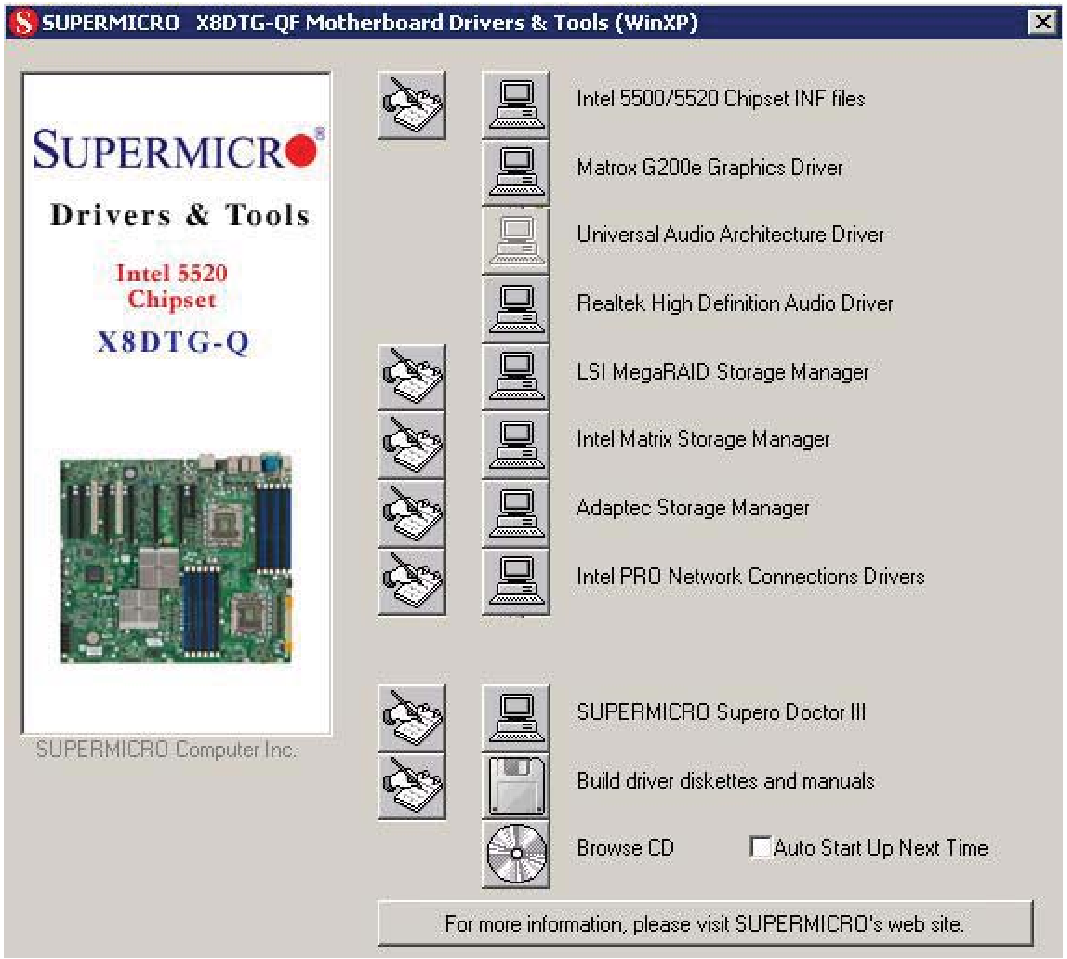
Serial ATA
Pin Definitions

Pin#	Definition
1	Ground
2	TX_P
3	TX_N
4	Ground
5	RX_N
6	RX_P
7	Ground

5-12 Installing Software

After the hardware has been installed, you should first install the operating system and then the drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard.

Figure 5-12. Driver/Tool Installation Display Screen


SUPERMICRO X8DTG-QF Motherboard Drivers & Tools (WinXP)

SUPERMICRO
Drivers & Tools
Intel 5520 Chipset
X8DTG-Q
SUPERMICRO Computer Inc.
Intel 5500/5520 Chipset INF files
Matrox G200e Graphics Driver
Universal Audio Architecture Driver
Realtek High Definition Audio Driver
LSI MegaRAID Storage Manager
Intel Matrix Storage Manager
Adaptec Storage Manager
Intel PRO Network Connections Drivers
SUPERMICRO Supero Doctor III
Build driver diskettes and manuals
Browse CD
☐ Auto Start Up Next Time
For more information, please visit SUPERMICRO's web site.

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must**

Supero Doctor III

The Supero Doctor III program is a Web base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The Supero Doctor III program included on the CD-ROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Note: The default User Name and Password for SuperDoctor III is ADMIN / ADMIN.

Note: When SuperDoctor III is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within Super Doctor, as the Super Doctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor III.

Figure 5-13. Supero Doctor III Interface Display Screen (Health Information)

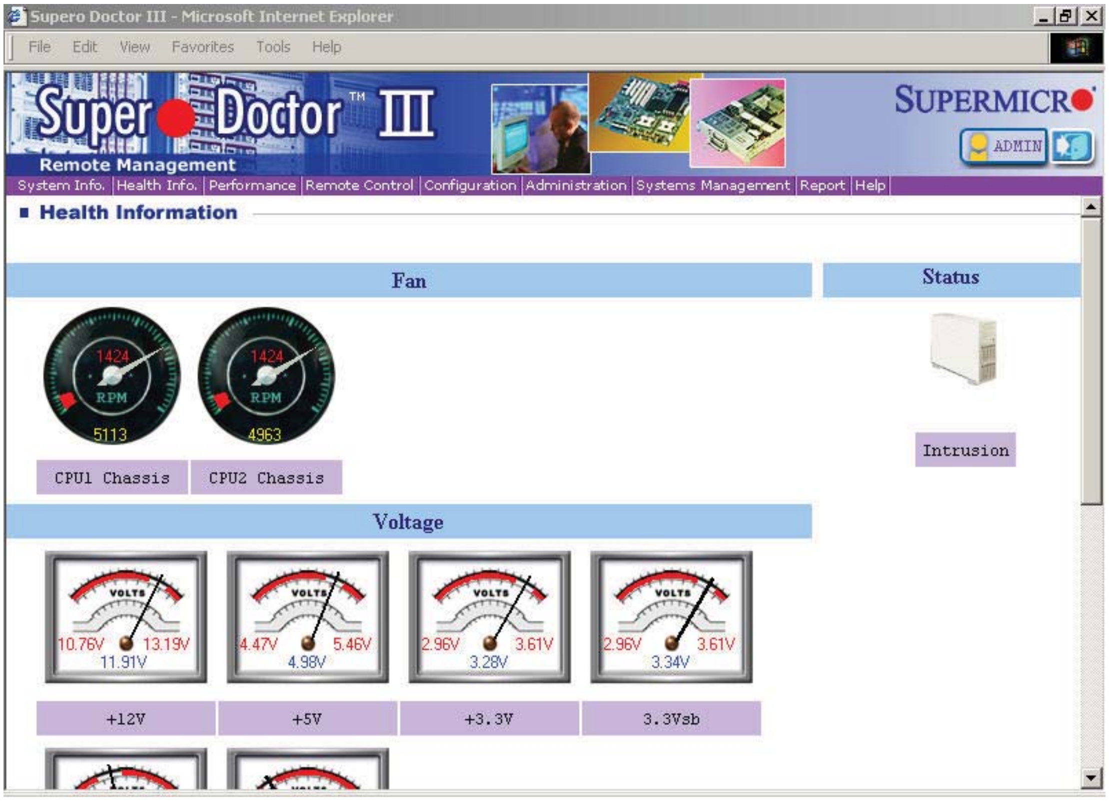
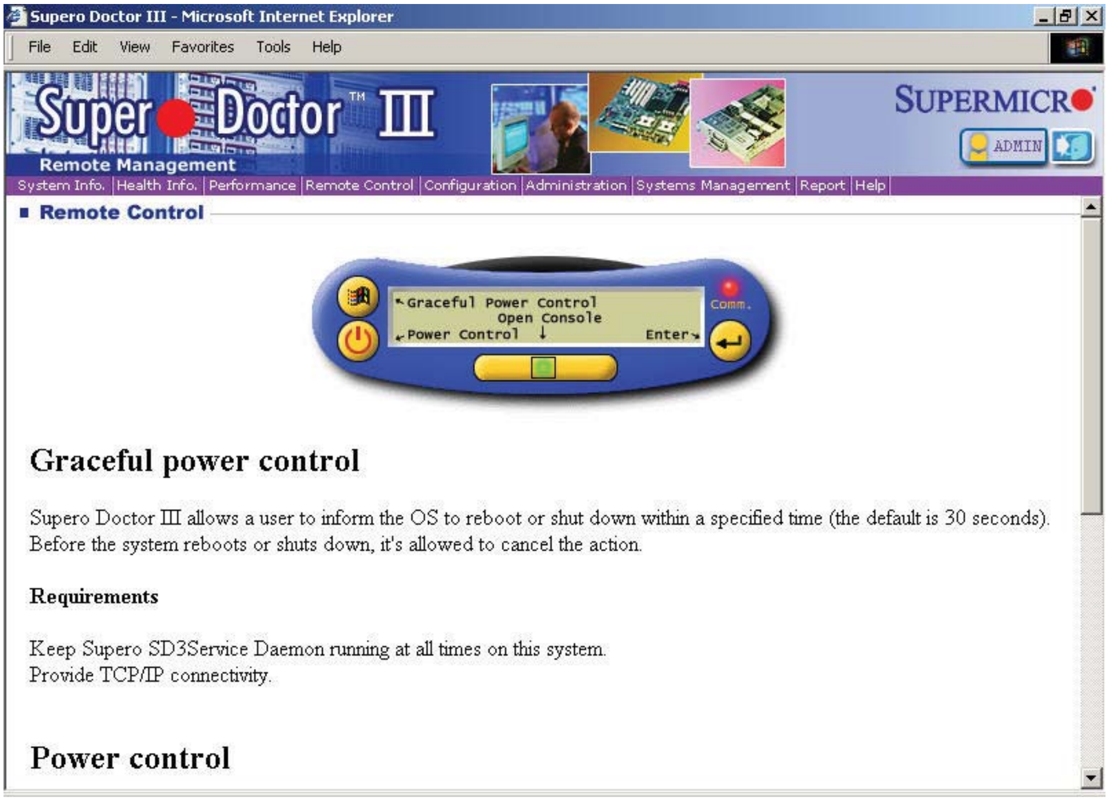

Supero Doctor III - Microsoft Internet Explorer
File
Edit
View
Favorites
Tools
Help
Super Doctor™ III
Remote Management
SUPERMICRO
ADMIN
System Info.
Health Info.
Performance
Remote Control
Configuration
Administration
Systems Management
Report
Help
Health Information
Fan
Status
1424
RPM
5113
1424
RPM
4963
CPU1 Chassis
CPU2 Chassis
Intrusion
Voltage
VOLTS
10.76V
13.19V
11.91V
VOLTS
4.47V
5.46V
4.98V
VOLTS
2.96V
3.61V
3.28V
VOLTS
2.96V
3.61V
3.34V
+12V
+5V
+3.3V
3.3Vsb

Figure 5-14. Supero Doctor III Interface Display Screen (Remote Control)


Supero Doctor III - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Super Doctor™ III
Remote Management
SUPERMICRO
ADMIN
System Info. | Health Info. | Performance | Remote Control | Configuration | Administration | Systems Management | Report | Help
Graceful Power Control
Open Console
Power Control
Enter
Comm.

Remote Control

Graceful power control

Supero Doctor III allows a user to inform the OS to reboot or shut down within a specified time (the default is 30 seconds). Before the system reboots or shuts down, it's allowed to cancel the action.

Requirements

Keep Supero SD3Service Daemon running at all times on this system.
Provide TCP/IP connectivity.

Power control

Note: SD III Software Revision 1.0 can be downloaded from our Web Site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download the SDIII User's Guide at: <http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf>. For Linux, we will recommend using Supero Doctor II.

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the chassis. The only tool you will need to install components and perform maintenance is a Phillips screwdriver. Print this page to use as a reference while setting up your chassis.

Tools Required: The only tool you will need to install components and perform maintenance is a Philips screwdriver.

Review the warnings and precautions listed in the manual before setting up or servicing this chassis. These include information in Chapter 4: System Safety and the warning/precautions listed in the setup instructions.

Figure 6-1. Chassis: Front and Rear Views

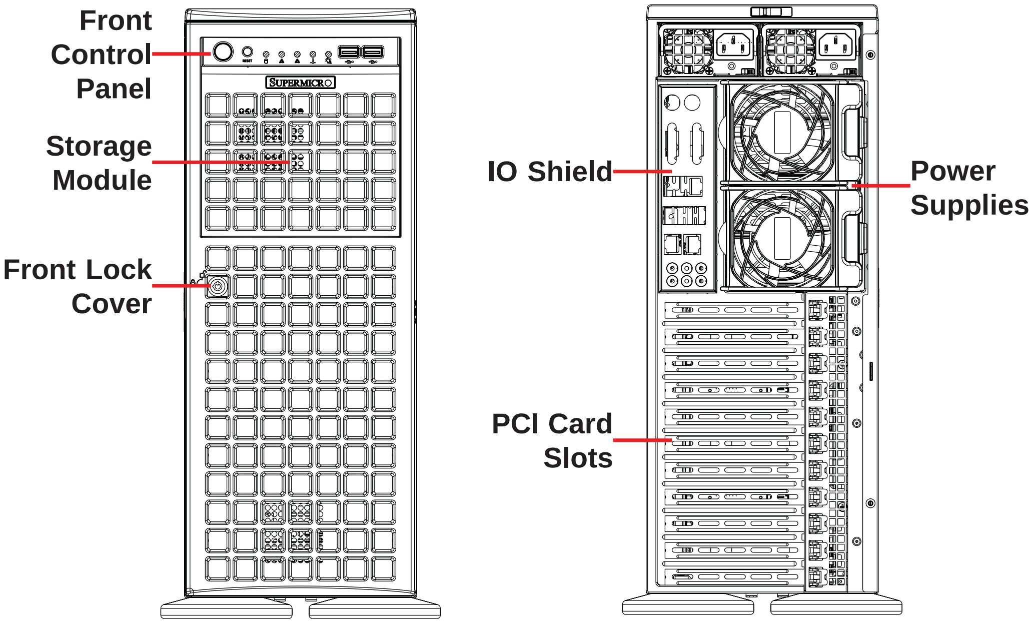
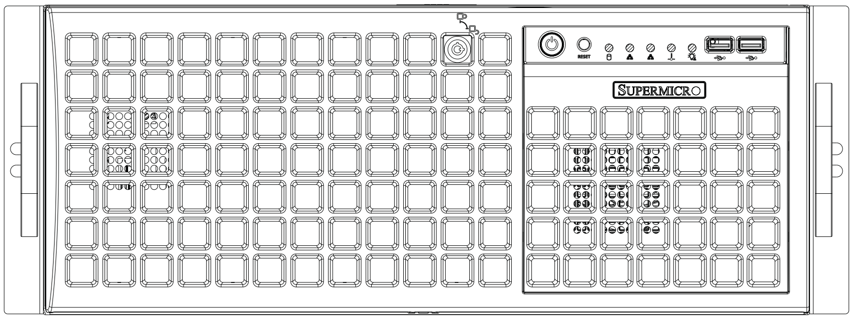

Front Control Panel
Storage Module
Front Lock Cover
SUPERMICRO
IO Shield
PCI Card Slots
Power Supplies

Figure 6-2: Chassis in Rack Mount Mode


SUPERMICRO

6-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully.

The following measures are generally sufficient to protect your equipment from ESD damage:

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the serverboard to the appropriate header on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF1 can be found in "Chapter 5: Advanced Serverboard Installation."

6-3 System Cooling

Six heavy-duty fans provide cooling for the chassis. Four fans are located in the mid-section of the chassis with two fans in the rear. These fans circulate air through the chassis as a means of lowering the chassis internal temperature.

The fans come pre-installed to the chassis. Each fan is hot-swappable and can be replaced without removing any connections.

System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fans will ramp up to full speed. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).

Replacing System Fans

The SC747 chassis contains two types of system fans: mid-system fans and rear system fans.

Replacing Mid-System Fans

1. Determine which fan has failed. Because the fans are hot-swappable, the chassis does not need to be powered-down.

2. Press the fan release tab and lift the failed fan from the chassis. Mid fans must be pulled straight out of the chassis (see Figure 6-3).

3. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans. As soon as the fan is connected, it will begin working.

Replacing the Rear System Fan

1. Determine which fan is not operation

2. Press the rear fan release tab (see Figure 6-4).

3. Pull the fan away from the chassis by pulling out the top first.

Figure 6-3: Mid-System Chassis Fans

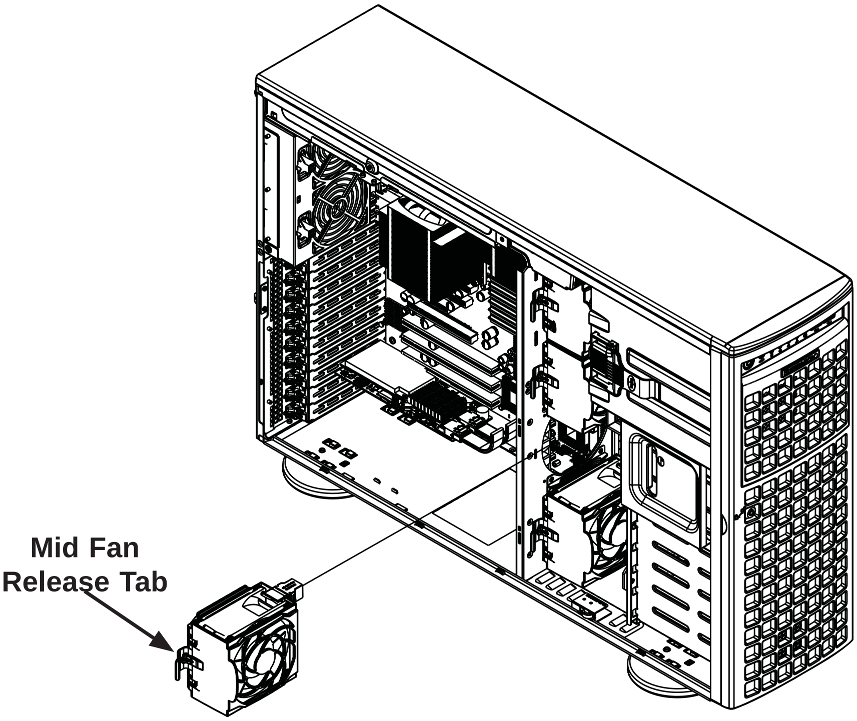
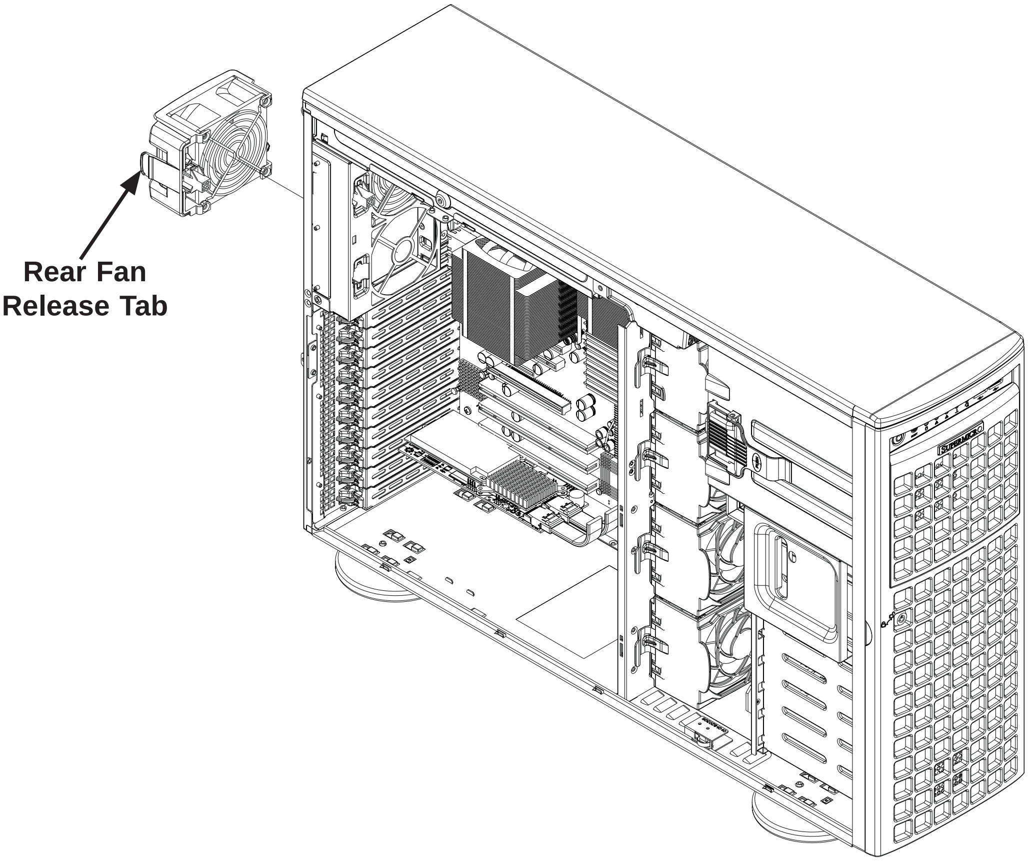

Mid Fan
Release Tab

Figure 6-4: Rear System Chassis Fans


Rear Fan
Release Tab

6-4 Power Supply

The SC747 chassis has a 1400W (redundant) power supply. This power supply is auto-switching capable. This enables it to automatically sense and operate at a 100v to 240v input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

Power Supply Failure

If the power supply module fails, the system will shut down and you will need to replace the module. Replacements can be ordered directly from Supermicro (see contact information in the Preface).

As there is only one power supply module in the system, power must be completely removed from the server before removing and replacing the power supply for whatever reason.

Replacing the Power Supply

With a redundant power supply, the system automatically switches to the second power supply if the first should fail.

Replacing the Power Supply

1. Power down the chassis and unplug the power cord. If your chassis includes a redundant power supply (at least two power modules), you can leave the server running and remove only one power supply.

2. Push the release tab (on the back of the power supply) as illustrated in Figure 6-5.

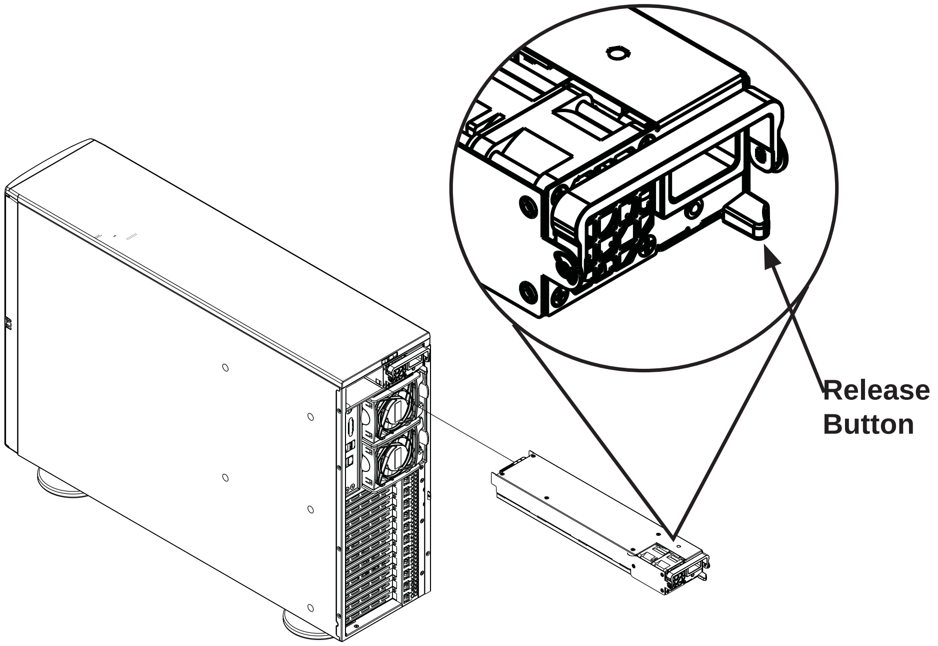
3. Pull the power supply out using the handle provided.

4. Replace the failed power module with the same model.

5. Push the new power supply module into the power bay until you hear a click.

6. Plug the AC power cord back into the module and power up the server.

Figure 6-5: Power Supply Release Button



Power Supply Connections

Connect each of the following cables, as required, by your motherboard manufacturer. In some instances, some cables may not need to be connected. Some cables may not be available with your model.

Power Supply Cables			
Name	**Qty**	**Connects to:**	**Description**
20-pin or 24-pin power cable	1	Motherboard	20-pin or 24-pin power cable provides electricity to the motherboard. and has twenty to twenty-four yellow, black, gray, red, orange, green and blue wires.
HDD (Hard Drive) power cable	2	Backplane	Each cable has three connectors (two Hard Drive [HDD] and one Floppy Drive [FDD]). Attach the HDD connectors to the backplane. **If you are using a Supermicro backplane, the FDD connector does not need to be attached.**
8-pin motherboard cable	1	Motherboard	Provides power to the motherboard CPU. This cable has two black and two yellow wires.
4-pin motherboard cable	1	Motherboard	Provides power to PCI expansion card. This cable has two black and two yellow wires.
5-pin SMBus power cable (small)	1	Motherboard	Allows the SM (System Management) bus to monitor power supply
2-pin INT cable	1	Motherboard	Intrusion detection cable allows the system to log when the server chassis has been opened.

6-5 Configuring the the Storage Module

This section covers configuring the storage module in the SC747 chassis.

Figure 6-6: Chassis in Rack Mount Mode

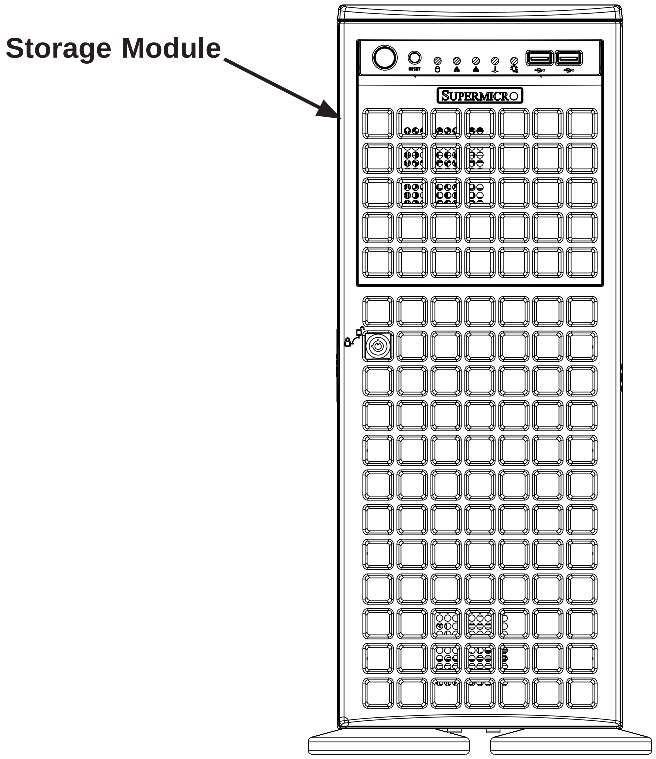
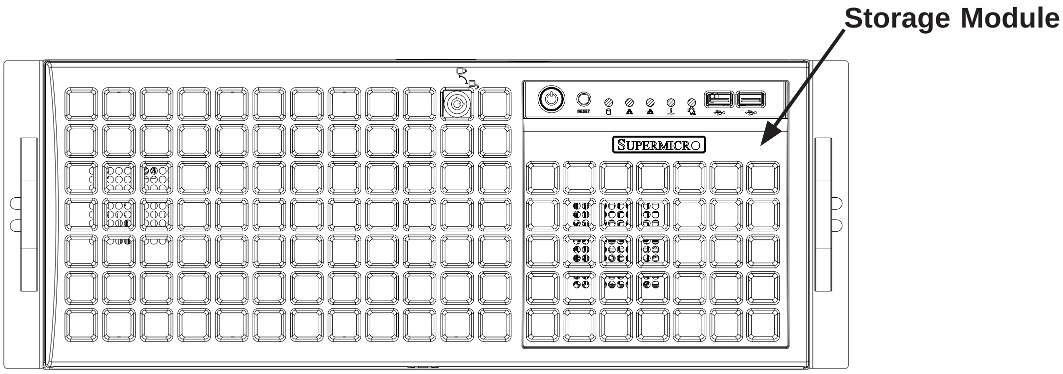


Figure 6-7: Chassis in Tower Mode



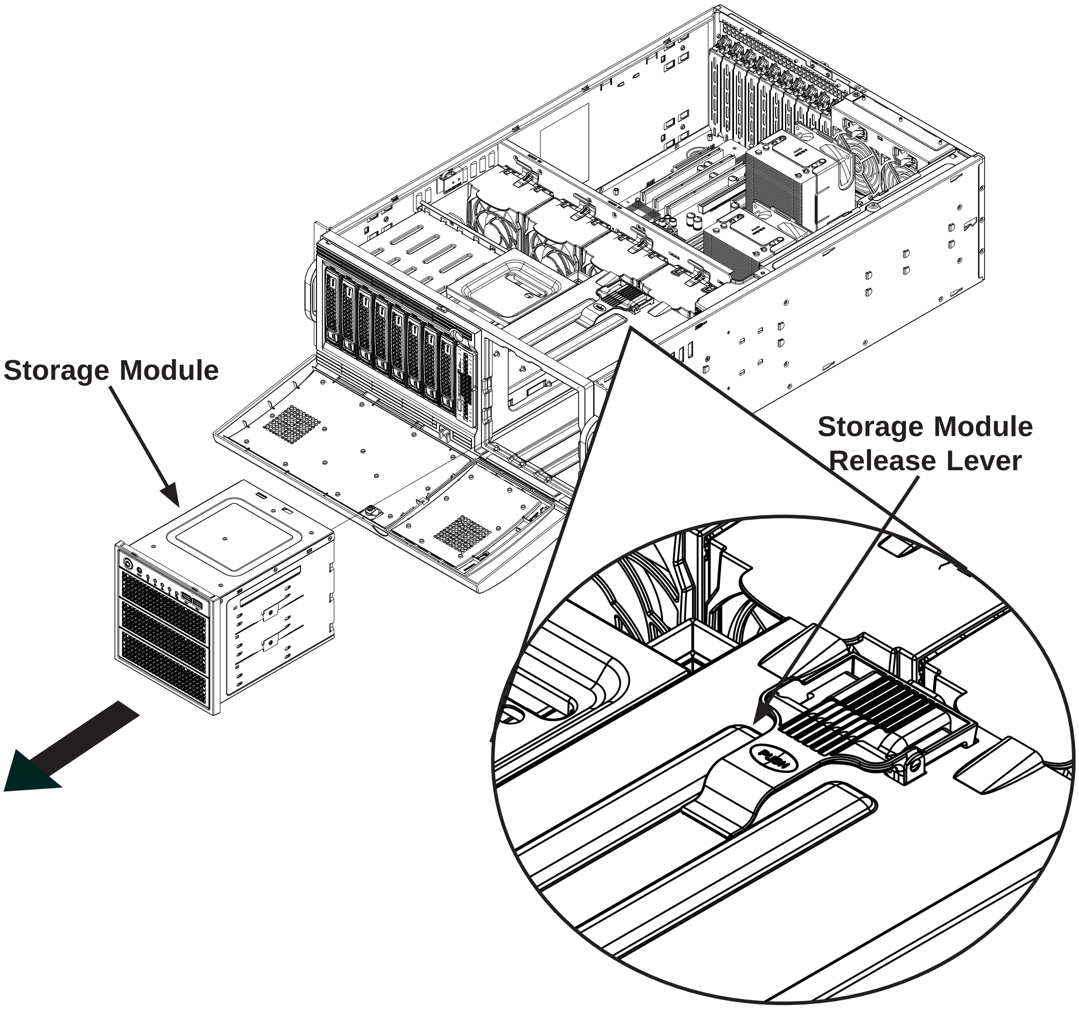
Tower or Rack Configuration

The SC747 chassis is shipped in tower mode and can be immediately used as desktop server. If the chassis is to be used in a rack, the storage module must be rotated 90 degrees and the storage moudule cover must be replaced (see Figure 6-7). This can be done before, during, or after setup. It is not necessary to replace the storage module cover when the chassis is in the tower configuration.

Rotating the Storage Module

Use the procedure below to rotate the storage module for rack configuration.

Figure 6-8: Removing the Storage Module



Rotating the Storage Module for Rack Mounting

1. Open the chassis cover.

2. Locate the storage module and disconnect any cables from the storage module to any component in the chassis.

3. Push the storage module release lever. This lever unlocks the storage module (see Figure 6-8).

4. Grasp the external edges of the storage module and pull the unit from the chassis.

5. Turn the storage module 90 degrees (as illustrated).

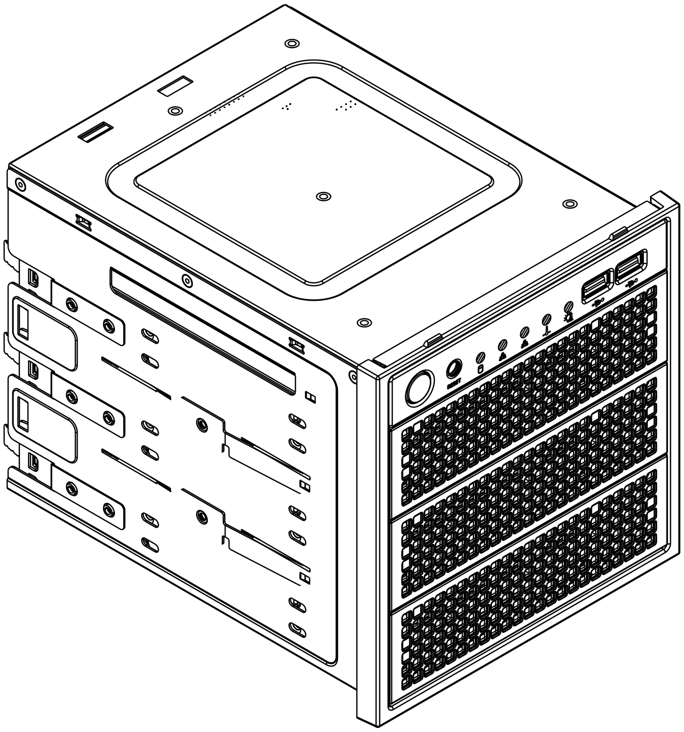
6. Reinsert the module into the chassis and reconnect the cords.

Installing Drives in the Storage Module

The storage module (Figure 6-9) includes three full sized drive bays and the front LED panel. The storage module can be configured in one of three ways:

- Add up to three extra hard drives to the drive trays.
- Add up to three peripheral drives (CD-ROM, DVD-ROM, etc.) drive trays.
- Add five hot-swappable hard drives to the storage module. This configuration requires a mobile rack. More information on mobile rack installation can be found in the appendices at the end of this manual.

Figure 6-9: Chassis Storage Module



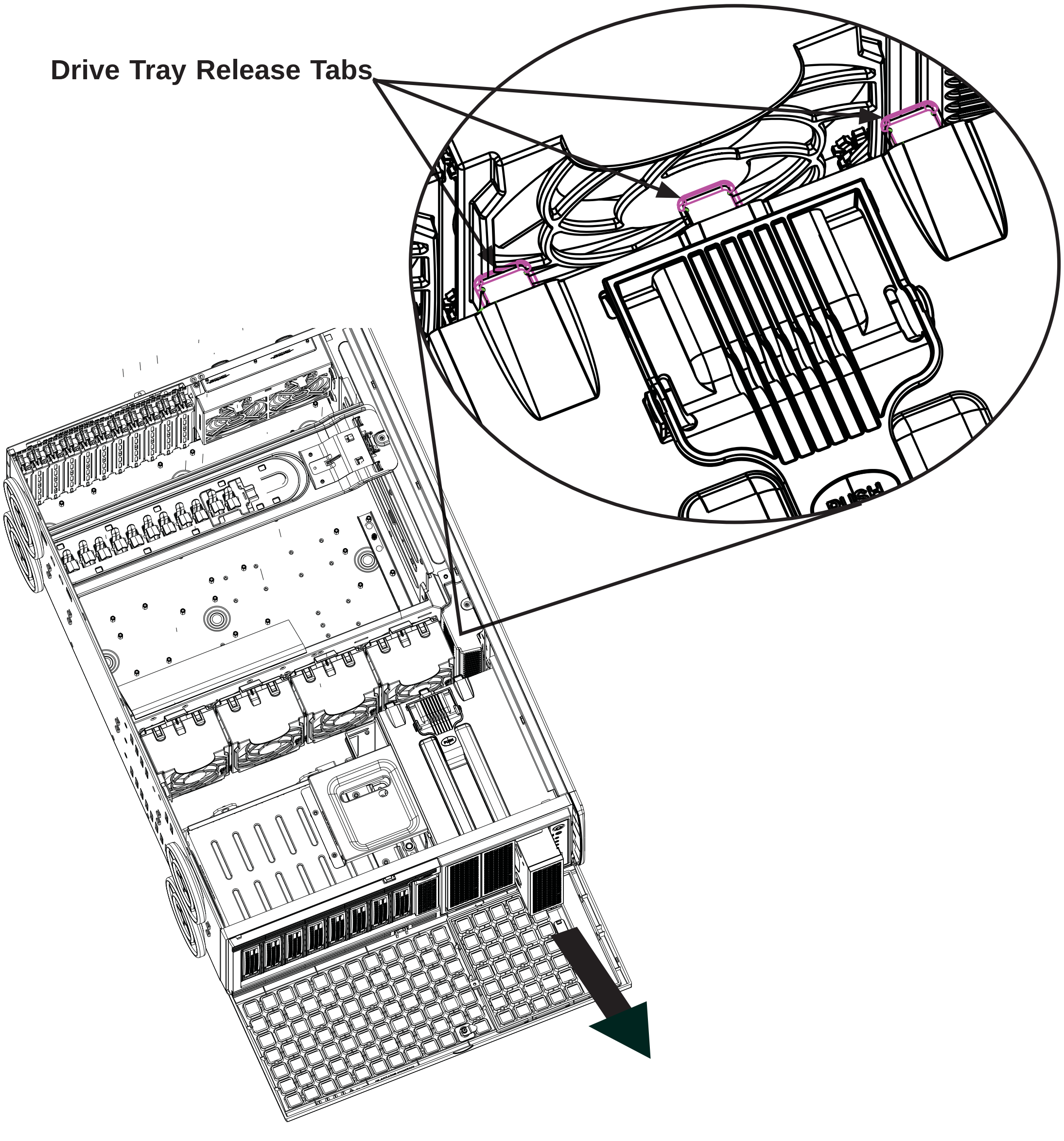
Removing a Drive Carrier

Use the procedure below to add hard drives to the drive carriers.

Adding Hard Drives to the Drive Carriers

1. Open the chassis cover.
2. Locate the drive tray release tab for the slot you want to place the peripheral drive (see Figure 6-10).
3. Push the drive tray toward the front of the chassis.

Figure 6-10: Removing a Drive Carrier



4. Place the hard drive to the hard drive tray. Make sure The hard drive can be SAS or SCSI depending on your motherboard. The hard drive may not completely fill the tray. See Figure 6-11 for details.

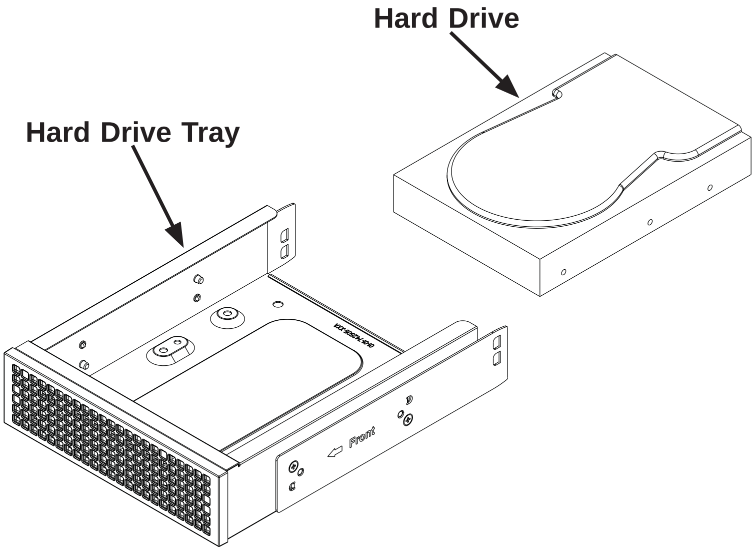
5. Secure the hard drive to the carrier with four screws from the bottom.

6. Slide the hard drive into the chassis until the carrier clicks into place.

7. Repeat these steps for each hard drive carrier.

Warning: Except for short periods of time (swapping hard drives), do not operate the server with the hard drive carriers removed.

Figure 6-11: Adding a Hard Drive to the Drive Carrier



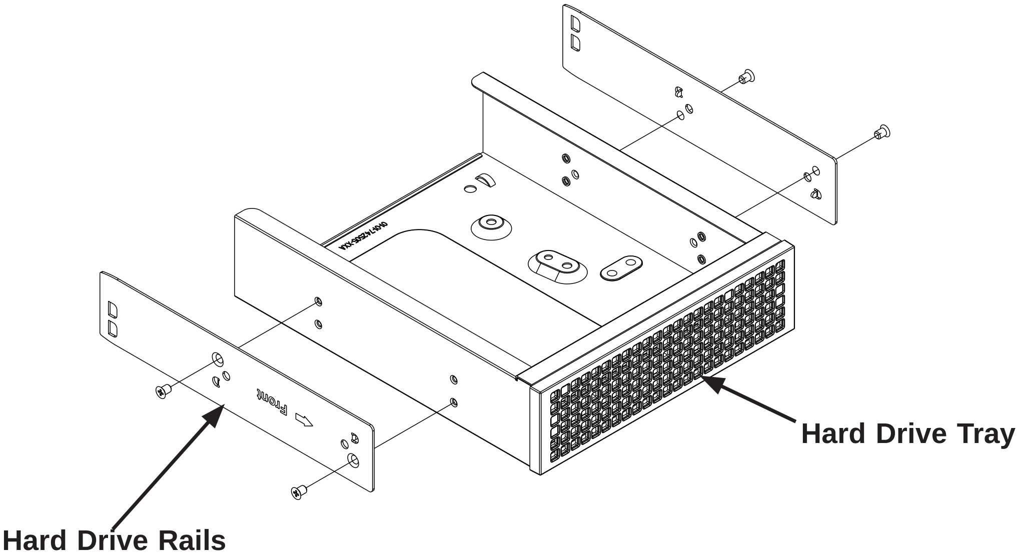
Adding Peripheral Drives

You can add up to three peripheral drives (DVD-ROM, CD-ROM, floppy drive, etc.) to the drive trays using the procedure below.

Adding Peripheral Drives

1. Open the chassis cover.
2. Locate the drive tray release tab for the slot you want to place the peripheral drive.
3. Push the drive tray toward the front of the chassis.
4. Remove the hard drive tray rails from the hard drive tray. To do this, you must remove two screws from each side (see Figure 6-12).
5. Attach the rails to a DVD-ROM, CD-ROM, floppy drive, or other peripheral. The rails should fit any standard sized peripherals.
6. Slide the peripheral into the chassis until the tray clicks into place.
7. Repeat these steps for each hard drive tray.

Figure 6-12: Adding Hard Drive Rails to the DVD-ROM Drive



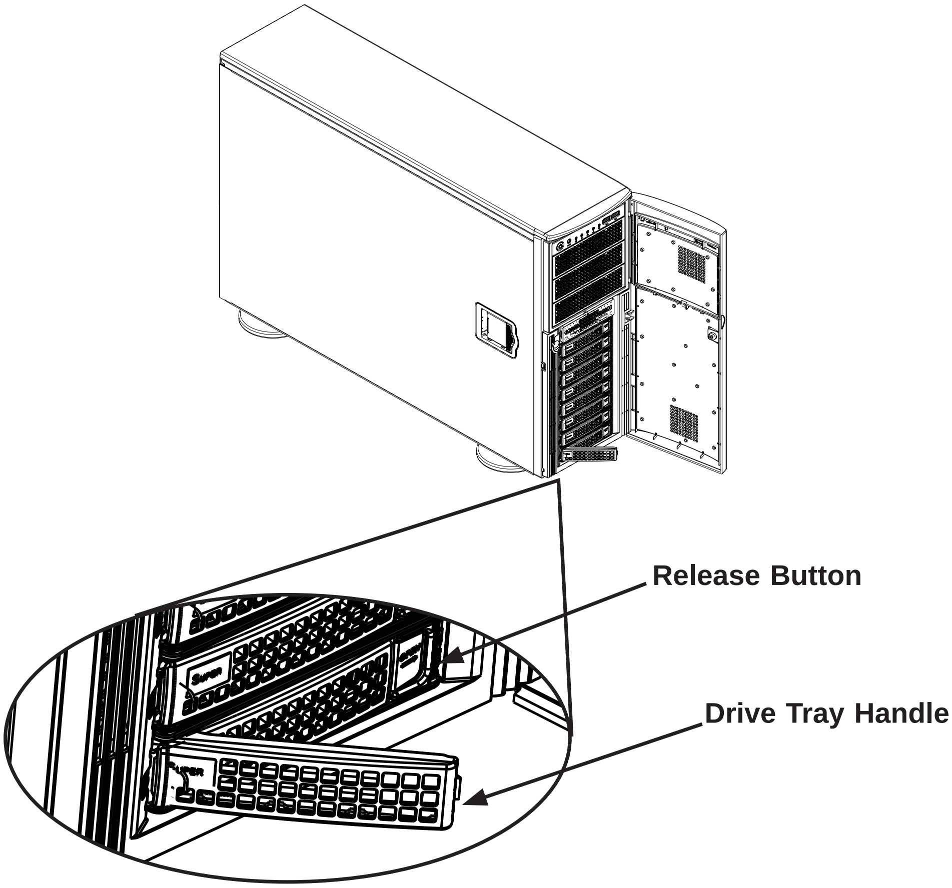
6-6 Installing Hard Drives in the Chassis

Chassis hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays.

Installing Hard Drives

1. Unlock and open the chassis cover.
2. Press the release button to extend the drive tray handle (see Figure 6-14).
3. Using the handle, pull the drive tray out by the handle. The drive is hot swappable; there are no cables to disconnect.
4. Remove the screws holding the drive tray to the dummy drive.

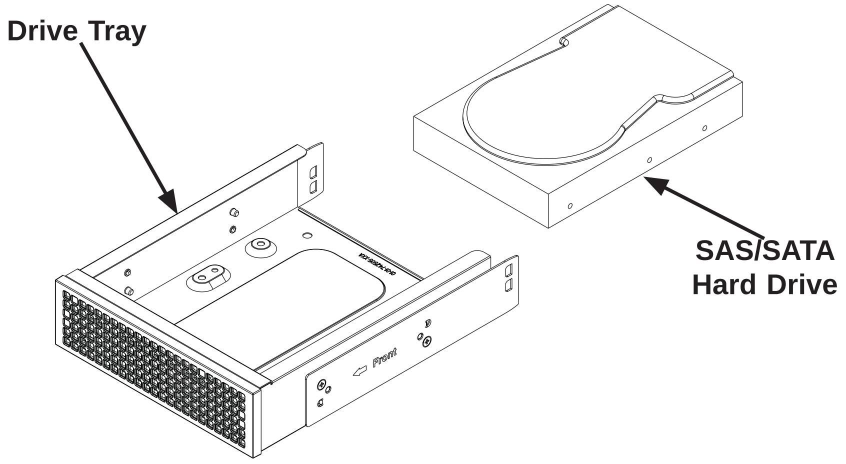
Figure 6-14: Installing Hard Drives



5. Place a hard drive in the drive tray (see Figure 6-15).

6. Secure the hard drive to the tray using four screws.

Figure 6-15: Removing a Dummy Drive Tray

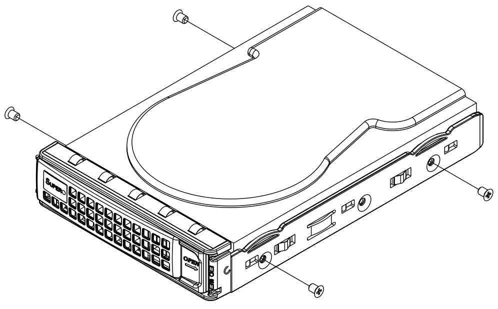


7. Insert the hard drive into the chassis. To do this:

   a. Press the hard drive release button to extend the drive tray handle.

   b. Insert the hard drive into the chassis and close the handle to lock the hard drive into place (see Figure 6-16).

Figure 6-16: Installing a Hard Drive



Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X8DTG-QF. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the <Delete> key while the system is booting up.

Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (**Note**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

Note: Options printed in **Bold** are default settings.

How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

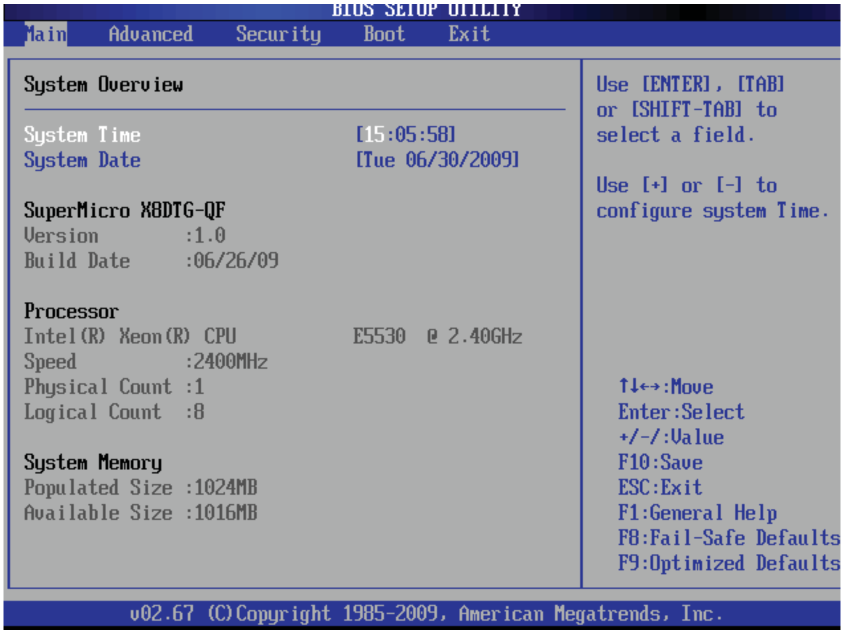
Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

Warning! Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

7-2 Main Setup

When you first enter the AMI BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.



```
System Overview                                    Use [ENTER], [TAB]
                                                   or [SHIFT-TAB] to
System Time                  [15:05:58]            select a field.
System Date                  [Tue 06/30/2009]
                                                   Use [+] or [-] to
SuperMicro X8DTG-QF                                configure system Time.
Version         :1.0
Build Date      :06/26/09

Processor
Intel(R) Xeon(R) CPU         E5530  @ 2.40GHz
Speed           :2400MHz
Physical Count  :1                                   ↑↓←→:Move
Logical Count   :8                                   Enter:Select
                                                     +/-/:Value
System Memory                                        F10:Save
Populated Size  :1024MB                              ESC:Exit
Available Size  :1016MB                              F1:General Help
                                                     F8:Fail-Safe Defaults
                                                     F9:Optimized Defaults

          v02.67 (C)Copyright 1985-2009, American Megatrends, Inc.
```

System Overview: The following BIOS information will be displayed:

System Time/System Date

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Enter new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.)

Supermicro X8DTG-QF

- BIOS Build Version: This item displays the BIOS revision used in your system.
- BIOS Build Date: This item displays the date when this BIOS was completed.

Processor

The AMI BIOS will automatically display the status of the processor used in your system:

- CPU Type: This item displays the type of CPU used in the motherboard.
- Speed: This item displays the speed of the CPU detected by the BIOS.
- Physical Count: This item displays the number of processors installed in your system as detected by the BIOS.
- Logical Count: This item displays the number of CPU Cores installed in your system as detected by the BIOS.

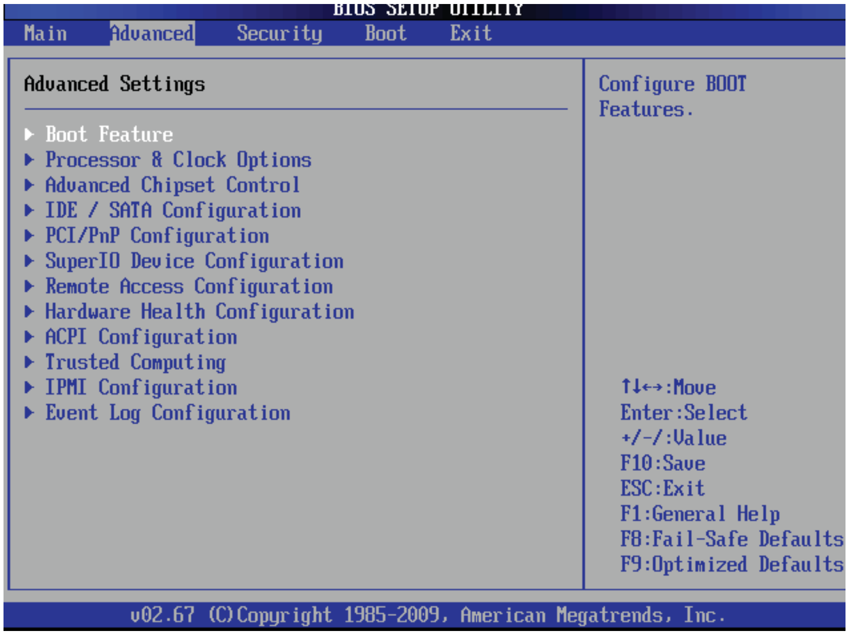
System Memory

This displays the size of memory available in the system:

- Populated Size: This item displays the memory size installed on the motherboard as detected by the BIOS.
- Available Size: This item displays the amount of memory available.

7-3 Advanced Setup Configurations

Use the arrow keys to select the Boot Setup submenu, and hit <Enter> to access the following items:


BIOS SETUP UTILITY
Main
Advanced
Security
Boot
Exit
Advanced Settings
▶ Boot Feature
▶ Processor & Clock Options
▶ Advanced Chipset Control
▶ IDE / SATA Configuration
▶ PCI/PnP Configuration
▶ SuperIO Device Configuration
▶ Remote Access Configuration
▶ Hardware Health Configuration
▶ ACPI Configuration
▶ Trusted Computing
▶ IPMI Configuration
▶ Event Log Configuration
↑↓↔:Move
Enter:Select
+/-/:Value
F10:Save
ESC:Exit
F1:General Help
F8:Fail-Safe Defaults
F9:Optimized Defaults

Configure BOOT Features.

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▶Boot Features

Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for system boot. The options are **Enabled** and Disabled.

Quiet Boot

This option allows the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

This sets the display mode for the Option ROM. Select Keep Current to use the current AddOn ROM Display setting. Select Force BIOS to use the Option ROM display mode set by the system BIOS. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

This feature allows the user to select the Power-on state for the Numlock key. The options are Off and **On**.

PS/2 Mouse Support

This feature enables the auto-detection of a PS/2 mouse. The options are Disabled, Enabled and **Auto**.

Wait For 'F1' If Error

This forces the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

Hit 'Del' Message Display

This feature displays "Press DEL to run Setup" during POST. The options are **Enabled** and Disabled.

Watch Dog Function

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

Power Button Function

If set to Instant_Off, the system will power off immediately as soon as the user hits the power button. If set to 4_Second_Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant_Off** and 4_Second_Override.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Power-On, Power-Off and **Last State**.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at bootup and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

▶Processor and Clock Options

This submenu allows the user to configure the Processor and Clock settings.

CPU Ratio

Select Manual to manually configure the CPU Ratio. Select Auto to allow the BIOS to automatically configure the CPU Ratio. The options are **Auto** and Manual.

Ratio CMOS Setting

This option allows the user to set the ratio between the CPU Core Clock and the FSB Frequency. The default setting depends on what type of CPU is installed. For example, the default setting is **[21]**. Press <+> or <-> on your keyboard to change this value.

Note: if an invalid ratio is entered, the AMI BIOS will restore the setting to the previous state.

Clock Spread Spectrum

Select Enable to use the feature of Clock Spectrum, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

Hardware Prefetcher (Available when supported by the CPU)

If set to Enabled, the hardware pre fetcher will pre fetch streams of data and instructions from the main memory to the L2 cache in the forward or backward manner to improve CPU performance. The options are Disabled and **Enabled**.

Adjacent Cache Line Prefetch (Available when supported by the CPU)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if **Enabled**.

MPS and ACPI MADT Ordering

This feature allows you to choose the method of ordering for the Multiple APIC Description Table (MADT). Select Modern Ordering for Microsoft Windows XP or later, Select Legacy Ordering for Microsoft Windows 2000 or earlier. The options are **Modern Ordering** and Legacy Ordering.

Intel® Virtualization Technology (Available when supported by the CPU)

Select Enabled to use the feature of Virtualization Technology to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled.

Note: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

Execute-Disable Bit Capability (Available when supported by the OS and the CPU)

Set to Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web Sites for more information.)

Simultaneous Multi-Threading (Available when supported by the CPU)

Set to Enabled to use the Simultaneous Multi-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

Active Processor Cores

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are **All,** 1 and 2.

Intel® EIST Technology

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. **Please refer to Intel's web site for detailed information.** The options are Disable (Disable GV3) and **Enable (Enable GV3)**.

Intel® Turbo Boost

Select Enabled to allow the processor cores to run faster than normal under special circumstances to improve performance. The options are Disable and **Enabled**.

C1E Support

Select Enabled to use the feature of Enhanced Halt State. C1E significantly reduces the CPU's power consumption by reducing the CPU's clock cycle and voltage during a Halt State. The options are Disabled and **Enabled**.

Intel® C-State Tech

If enabled, C-State is set by the system automatically to either C2, C3 or C4 state. The options are Disabled and **Enabled**.

C-State package limit setting (Available when Intel® C-State Tech is enabled)

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are **Auto**, C1, C3, C6 and C7.

C1 Auto Demotion

When enabled, the CPU will conditionally demote C3, C6 or C7 requests to C1 based on un-core auto-demote information. The options are Disabled and **Enabled.**

C3 Auto Demotion

When enabled, the CPU will conditionally demote C6 or C7 requests to C3 based on un-core auto-demote information. The options are Disabled and **Enabled.**

ACPI T State

Select Enabled to report processor throttling in ACPI. The options are **Disabled** and Enabled.

DCA Technology

When set to Enabled, this feature accelerates the performance of TOE devices.

Note: A TOE device is a specialized, dedicated processor that is installed on an add-on card or a network card to handle some or all packet processing of this add-on card. For this motherboard, the TOE device is built inside the ESB 2 South Bridge chip. This feature is supported only by some types of processors. The options are **Enabled** and Disabled.

DCA Prefetch Delay

A DCA (Direct Cache Access) Prefetch is used with TOE components to prefetch data in order to shorten execution cycles and maximize data processing efficiency. Prefetching too frequently can saturate the cache directory and delay necessary cache accesses. This feature reduces or increases the frequency the system prefetches data. The options are [8], [16], **[32]**, [40], [48], [56], [64], [72], [80], [88], [96], [104], [112], [120]

▶Advanced Chipset Control

The items included in the Advanced Settings submenu are listed below:

▶QPI and IMC Configuration

QPI Links Speed

This feature selects QPI's data transfer speed. The options are Slow-mode, and **Full Speed**.

QPI Frequency

This selects the desired QPI frequency. The options are **Auto**, 4.800 GT, 5.866GT, 6.400 GT.

QPI L0s and L1

This enables the QPI power state to low power. L0s and L1 are automatically selected by the motherboard. The options are Disabled and **Enabled**.

Memory Frequency

This feature forces a DDR3 frequency slower than what the system has detected to run at the frequency as specified. The available options are **Auto**, Force DDR-800, Force DDR-1066, Force DDR-1333 and Force SPD.

Memory Mode

The options are **Independent**, Channel Mirror, Lockstep and Sparing.

Independent - All DIMMs are available to the operating system.

Channel Mirror - The motherboard maintains two identical copies of all data in memory for redundancy.

Lockstep - The motherboard uses two areas of memory to run the same set of operations in parallel.

Sparing - A preset threshold of correctable errors is used to trigger fail-over. The spare memory is put online and used as active memory in place of the failed memory.

Demand Scrubbing

A memory error-correction scheme where the Processor writes corrected data back into the memory block from where it was read by the Processor. The options are Enabled and **Disabled**.

Patrol Scrubbing

A memory error-correction scheme that works in the background looking for and correcting resident errors. The options are Enabled and **Disabled**.

Throttling - Closed Loop/Throttling - Open Loop

Throttling improves reliability and reduces power in the processor by automatic voltage control during processor idle states. Available options are **Disabled** and Enabled. If Enabled, the following items will appear:

Hysteresis Temperature (Closed Loop only)

Temperature Hysteresis is the temperature lag (in degrees Celsius) after the predefined DIMM temperature threshold is reached before Closed Loop Throttling begins. The options are **Disabled**, 1.5^{o}C, 3.0^{o}C, and 6.0^{o}C.

Guardband Temperature (Closed Loop only)

This is the temperature applied to the DIMM temperature threshold. Each step is in 0.5^{o}C increments. The default is **[006]**. Press <+> or <-> on your keyboard to change this value.

Inlet Temperature

This is the temperature detected at the chassis inlet. Each step is in 0.5^{o}C increments. The default is **[070]**.

Temperature Rise

This is the temperature rise used for the DIMM thermal zone. Each step is in 0.5^{o}C increments.

Air Flow

This is the air flow speed to the DIMM modules. Each step is one mm/sec. The default is **[1500]**.

Altitude

This feature defines how many meters above or below sea level the system is located. The options are **Sea Level or Below,** 1~300, 301~600, 601~900, 901~1200, 1201~1500, 1501~1800, 1801~2100, 2101~2400, 2401~2700, 2701~3000.

DIMM Pitch

This is the physical space between two DIMM modules. Each step is in 1/1000 of an inch. The default is **[400]**.

HDA Controller

Select Enabled to activate the onboard High-Definition Audio controller. The options are **Enabled** and Disabled.

Front Side Audio Mode

This feature allows the user to select Audio Mode for the front side audio connection. The default setting is **HD Audio**.

Intel VT-d

Select Enabled to enable Intel's Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully protected I/O resource sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are Enabled and **Disabled**.

SR-IOV Support

Enable this item to support Single Root I/O Virtualization and Sharing (SR-IOV). The options are **Disabled** and Enabled.

NUMA Support

Select Enabled to efficiently execute applications under Non-Uniform Memory Architecture (NUMA)-aware Operating Systems. Select Disabled for better memory access under non-NUMA aware Operating Systems. The options are **Enabled** and Disabled.

Intel I/OAT

The Intel I/OAT (I/O Acceleration Technology) significantly reduces CPU overhead by leveraging CPU architectural improvements, thus freeing resources for other tasks. The options are Disabled and **Enabled.**

Active State Power Management

Select Enabled to enable Active-State Power Management support for signal transactions between L0 and L1 Links on the PCI Express Bus. This maximizes power-saving and transaction speed. The options are Enabled and **Disabled**.

Route Port 80h Cycles to

This feature allows the user to decide which bus to send debug information to. The options are PCI and **LPC**.

USB Functions

This feature allows the user to enable onboard USB support. The Options are: Disabled, 2 USB Ports, 4 USB Ports,. 6 USB Ports, 8 USB Ports, 10 USB Ports and **12 USB Ports.**

USB 2.0 Controller

Select Enabled to activate the onboard USB 2.0 controller. The options are **Enabled** and Disabled. (The manufacturer's default setting is Enabled. This setting cannot be changed by the user.)

Legacy USB Support

Select Enabled to use Legacy USB devices. Select Auto to automatically enable Legacy USB support if a legacy USB device is installed, and vise versa. Select Disabled to disable Legacy USB support. The options are Disabled, **Auto**, and Enabled.

▶IDE/SATA/Floppy Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the IDE devices and displays the following items:

SATA#1 Configuration

Select Compatible to set SATA#1 to legacy compatibility mode. Select Enhanced to set SATA#1 to native SATA mode. The options are Disabled, Compatible and **Enhanced**.

Configure SATA#1 as

This feature allows the user to select the drive type for SATA#1. Select RAID (Intel) to enable Intel's SATA RAID firmware to configure Intel's SATA RAID settings. Select RAID (Adaptec) to enable Adaptec's SATA RAID firmware to configure Adaptec's SATA RAID settings. Select AHCI to enable SATA Advanced Host Interface. (Take caution when using this function. This feature is for advanced programmers only.) The options are **IDE,** RAID (Intel), RAID (Adaptec) and AHCI.

SATA#2 Configuration

Select Enhanced to set SATA#2 to native SATA mode. The options are Disabled, and **Enhanced**.

IDE Detect Timeout (sec)

Use this feature to set the time-out value for the BIOS to detect the ATA and ATAPI devices installed in the system. The options are 0 (sec), 5, 10, 15, 20, 25, 30, and **35**.

Primary IDE Master/Slave, Secondary IDE Master/Slave, Third IDE Master, and Fourth IDE Master

These settings allow the user to set the parameters of the IDE slots as specified. Press <Enter> to activate the following submenu items. Set the correct configurations accordingly.

Type

This feature allows the user to select the type of device connected to the slot. Select Auto to allow the BIOS to automatically select the device type as it is detected on the slot. Select CD/DVD to configure the slot for CD/DVD devices. Select ARMD to use this slot for removable devices. The options are Not Installed, **Auto**, CD/DVD and ARMD.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In the LBA mode, the maximum drive capacity is 137 GB. For drive capacities over 137 GB, your system must be equipped with a 48-bit LBA mode addressing. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

Block Mode boosts the IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if Block Mode is not used. Block Mode allows transfers of up to 64 KB per interrupt. Select Disabled to allow data to be transferred from and to the device one sector at a time. Select Auto to allow data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

PIO Mode

The IDE PIO (Programmable I/O) Mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4.

Select Auto to allow the AMI BIOS to automatically detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.

Select 0 to allow the AMI BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MB/s.

Select 1 to allow the AMI BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MB/s.

Select 2 to allow the AMI BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MB/s.

Select 3 to allow the AMI BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MB/s.

Select 4 to allow the AMI BIOS to use PIO mode 4. It has a data transfer bandwidth of 32-Bits. Select Enabled to enable 32-Bit data transfer.

DMA Mode

Select Auto to allow the BIOS to automatically detect IDE DMA mode when the IDE disk drive support cannot be determined.

Select SWDMA0 to allow the BIOS to use Single Word DMA mode 0. It has a data transfer rate of 2.1 MB/s.

Select SWDMA1 to allow the BIOS to use Single Word DMA mode 1. It has a data transfer rate of 4.2 MB/s.

Select SWDMA2 to allow the BIOS to use Single Word DMA mode 2. It has a data transfer rate of 8.3 MB/s.

Select MWDMA0 to allow the BIOS to use Multi Word DMA mode 0. It has a data transfer rate of 4.2 MB/s.

Select MWDMA1 to allow the BIOS to use Multi Word DMA mode 1. It has a data transfer rate of 13.3 MB/s.

Select MWDMA2 to allow the BIOS to use Multi-Word DMA mode 2. It has a data transfer rate of 16.6 MB/s.

Select UDMA0 to allow the BIOS to use Ultra DMA mode 0. It has a data transfer rate of 16.6 MB/s. It has the same transfer rate as PIO mode 4 and Multi Word DMA mode 2.

Select UDMA1 to allow the BIOS to use Ultra DMA mode 1. It has a data transfer rate of 25 MB/s.

Select UDMA2 to allow the BIOS to use Ultra DMA mode 2. It has a data transfer rate of 33.3 MB/s.

Select UDMA3 to allow the BIOS to use Ultra DMA mode 3. It has a data transfer rate of 66.6 MB/s.

Select UDMA4 to allow the BIOS to use Ultra DMA mode 4. It has a data transfer rate of 100 MB/s.

Select UDMA5 to allow the BIOS to use Ultra DMA mode 5. It has a data transfer rate of 133 MB/s.

Select UDMA6 to allow the BIOS to use Ultra DMA mode 6. It has a data transfer rate of 133 MB/s. The options are **Auto**, SWDMAn, MWDMAn, and UDMAn.

S.M.A.R.T. For Hard disk drives

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select Auto to allow the AMI BIOS to automatically detect hard disk drive support. Select Disabled to prevent the AMI BIOS from using the S.M.A.R.T. Select Enabled to allow the AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

32Bit Data Transfer

Select Enable to enable 32-bit IDE data transferring support. The options are **Enabled** and Disabled.

▶PCI/PnP Configuration

Clear NVRAM

This feature clears the NVRAM during system boot. The options are **No** and Yes.

Plug & Play OS

Selecting Yes allows the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select **No** to allow the AMI BIOS to configure all devices in the system.

PCI Latency Timer

This feature sets the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

PCI IDE Bus Master

When enabled, the BIOS uses PCI bus mastering for reading/writing to IDE drives. The options are Disabled and **Enabled.**

PCIe I/O Performance

Some add-on cards perform faster with the coalesce feature, which limits the payload size to 128B; while others, with a payload size of 256B by disabling coalesce support. Please refer to your add-on card user guide for the desired setting. The options are 256B and **128B**.

ROM Scan Ordering

This item determines what kind of option ROM activates over another. The options are **Onboard First** and Add-on First.

PCI-E Slot 1 x4 (in x16 slot), PCI-E Slot 2 x4 (in x16 slot), PCI Slot 3 33MHz, PCI-E Slot 4 x16, PCI Slot 5 33MHz, PCI-E Slot 6 x16, PCI-E Slot 6 x16, PCI-E Slot 8 x16, PCI-E Slot 10 x16, PCI-E Slot 11 x4 (in x8 Slot)

Use this setting to disable any of the PCI slots. The options are Disabled and **Enabled.**

Onboard LAN Option ROM Select

The item selects the type of onboard option ROM to load. The options are **PXE** and iSCSI.

Load Onboard LAN 1 Option ROM/Load Onboard LAN 2 Option ROM

Select Enabled to enable onboard LAN1/LAN2 Option ROMs support which will allow you to boot your systems using a network interface. The options are Enabled and **Disabled**.

Graphic Adapter Boot Priority

This option selects the graphics adapter the system uses as the primary boot device. The options are Other, **Onboard VGA** and Slot 6.

▶Super IO Device Configuration

Serial Port1 Address/Serial Port2 Address

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable. Select 3F8/IRQ4 to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options for Serial Port1 are Disabled, **3F8/IRQ4**, 3E8/IRQ4, 2E8/IRQ3. The options for Serial Port2 are Disabled, **2F8/IRQ3**, 3E8/IRQ4, and 2E8/IRQ3.

Serial Port 2 Attribute

This feature enables COM2 to act as a virtual COM Port for Serial Over LAN (SOL). The options are COM and **SOL**.

▶Remote Access Configuration

Remote Access

This allows the user to enable Remote Access support. The options are **Disabled** and Enabled. If Remote Access is set to Enabled, the following items will display:

Serial Port Number

This feature allows the user decide which serial port to be used for Console Redirection. The options are **COM 1** and COM2,

Base Address, IRQ

This item displays the base address and IRQ of the serial port used for Console Redirection.

Serial Port Mode

This feature allows the user to set the serial port mode for Console Redirection. The options are **115200 8, n 1**; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and 9600 8, n, 1.

Flow Control

This feature allows the user to set the flow control for Console Redirection. The options are **None**, Hardware, and Software.

Redirection After BIOS POST

Select Disabled to turn off Console Redirection after Power-On Self-Test (POST). Select Always to keep Console Redirection active all the time after POST. (Note: This setting may not be supported by some operating systems.) Select Boot Loader to keep Console Redirection active during POST and Boot Loader. The options are Disabled, Boot Loader, and **Always**.

Terminal Type

This feature allows the user to select the target terminal type for Console Redirection. The options are ANSI, **VT100**, and VT-UTF8.

VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are **Enabled** and Disabled.

Sredir Memory Display Delay

This feature defines the length of time in seconds to display memory information. The options are **No Delay,** Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.

▶Hardware Health Configuration

This feature allows the user to monitor system health and review the status of each item as displayed.

CPU Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat.

Warning!

1. Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed.

2. To avoid possible system overheating, please be sure to provide adequate airflow to your system.

The options are:

- The Early Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

- **The Default Alarm**: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about 5ºC above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action as shown below.

CPU Temperature/System Temperature

This feature displays current temperature readings for the CPU and the System.

The following items will be displayed for your reference only:

CPU 1 Temperature/CPU 2 Temperature

The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is each CPU is embedded by unique temperature information that the motherboard can read. This ‘Temperature Threshold’ or ‘Temperature Tolerance’ has been assigned at the factory and is the baseline on which the motherboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different ‘Temperature Tolerances’, the installed CPU can now send information to the motherboard what its ‘Temperature Tolerance’ is, and not the other way around. This results in better CPU thermal management.

Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU’s temperature status, rather than by just simply seeing a temperature reading. The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

Low – This level is considered as the ‘normal’ operating state. The CPU temperature is well below the CPU ‘Temperature Tolerance’. The motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

Medium – The processor is running warmer. This is a ‘precautionary’ level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU ‘Temperature Tolerance’. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

High – The processor is running hot. This is a ‘caution’ level since the CPU’s ‘Temperature Tolerance’ has been reached (or has been exceeded) and may activate an overheat alarm.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

Notes: 1. The system may shut down if it continues for a long period to prevent damage to the CPU.

2. The information provided above is for your reference only. For more information on thermal management, please refer to Intel’s Web site at www.Intel.com.

DIMM, GPU1/2, GPU3/4, IOH0, IOH1 Temperature: The temperature for each sensor indicated will be displayed (in degrees in Celsius and Fahrenheit) as detected by the BIOS.

Fan1 ~ Fan 10 Reading

This feature displays the fan speed readings from Fan1 through Fan8. (Fan1 is CPU1 Fan and Fan2 is CPU2 Fan.)

System Fan Monitor

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vice versa. Select Workstation/Desktop if your system is used as a Workstation or Desktop. Select Server if your system is used as a Server. Select **Full Speed** to disable the fan speed control function and allow the onboard fans to constantly run at full speed (12V). The Options are: **1. Full-speed)**, 2. Server 3. Workstation/Desktop and Super Quiet.

Voltage Monitoring

CPU1 Vcore, CPU2 Vcore, CPU1 VTT, CPU2 VTT, CPU1 DDR3 1.5V, CPU2 DDR3 1.5V, ICH 1.5V, IOH 1.8V, 5V, 12V, -12V, 3.3V, 3.3Vsb, Vbat, IOH 1.1V

▶ACPI Configuration

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

High Performance Event Timer

Select Enabled to activate the High Performance Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

USB Device Wake-Up

Select Enabled for the system to wake up from Standby mode by a Universal Serial Bus (USB) device (such as, a USB mouse or USB keyboard). The options are **Enabled** and Disabled.

PS/2 KB/MS Wake-Up

This feature is used to awaken from Standby mode by a PS/2 mouse or PS/2 keyboard. The options are Enabled and **Disabled**.

ACPI Aware O/S

Enable ACPI support if it is supported by the OS to control ACPI through the Operating System. Otherwise, disable this feature. The options are **Yes** and No.

Suspend Mode

This setting allows you to configure the ACPI (Advanced Configuration and Power Interface) state for your system when it is in the Suspend mode. The options are **S1 (POS)**, S3 (STR) and Auto.

ACPI APIC Support

Select Enabled to include the ACPI APIC Table Pointer in the RSDT (Root System Description Table) pointer list. The options are **Enabled** and Disabled.

APIC ACPI SCI IRQ

When this item is set to Enabled, APIC ACPI SCI IRQ is supported by the system. The options are Enabled and **Disabled**.

Headless Mode

This feature is used to enable system to function without a keyboard, monitor or mouse attached The options are Enabled and **Disabled**.

ACPI Version Features

The options are ACPI v1.0, **ACPI v2.0** and ACPI v3.0. Please refer to ACPI's website for further explanation: http://www.acpi.info/.

▶Trusted Computing (This option is available for OEM only.)

TCG/TPM Support

Select Yes to enable support for trusted platforms (TPM 1.1/1.2) and allow the BIOS to automatically download the drivers needed to provide support for the platforms specified. The options are Yes and **No**.

Indicate Physical

This feature Enables indication of physical presence to the TPM device each time the system starts. The options are **No** and Yes.

TPM Deactivated/Activated

This feature activates or disables the TPM device. The options are **Don't Change**, Set and Clear.

TPM Owner

This feature installs or clears TPM ownership The options are **Don't Change**, Enable Install, Disable Install and Clear.

Execute TPM Command

This feature Enables or Disables the sending of commands to the TPM. The options are **Don't Change**, Enabled and Disabled.

Clear the TPM

Press <Enter> to clear the TPM memory. This will erase all information related to TPM support.

If TCG/TPM Support is set to Yes, the TPM Status will display:

- TPM Enable/Disable Status

- TPM Owner Status

▶IPMI Configuration

Intelligent Platform Management Interface (IPMI) is a set of common interfaces that are used for hardware health monitoring and system management. For more information on the IPMI specifications, please visit Intel's web site at www.intel.com.

IPMI Firmware Revision

This item displays the IPMI firmware revision used in your system.

Status of BMC

Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. This is an informational feature which returns the status code of the BMC micro controller.

▶View BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of entries of BMC System Events.

To view an event, select an Entry Number and pressing <Enter> to display the information as shown in the screen.

- SEL Entry Number
- SEL Record ID
- SEL Record Type
- Event Timestamp
- Generator ID
- Event Message Format Ver
- Event Sensor Type
- Event Sensor Number,
- Event Dir Type
- Event Data.

Clear BMC System Event Log

Clear BMC System Log

Select OK and press the <Enter> key to clear the BMC system log. Select Cancel to keep the BMC System log. The options are **OK** and Cancel.

Caution: Any cleared information is unrecoverable. Make absolutely sure that you no longer need any data stored in the log before clearing the BMC Event Log.

▶Set LAN Configuration

Set this feature to configure the IPMI LAN adapter with a network address as shown in the following graphics.

Channel Number

Enter the channel number for the SET LAN Config command.

Channel Number Status

This feature returns the channel status for the Channel Number selected above: "Channel Number is OK" or "Wrong Channel Number".

▶IP Address Configuration

Parameter Selector

This item displays the parameter of your IP Address configuration.

IP Address Source

Select the source of this machine's IP address. If Static is selected, you will need to know and enter manually the IP address of this machine below. If DHCP is selected, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network it is attached to, and request the next available IP address. The options are **DHCP** and Static.

IP Address

This item displays the IP address for the IPMI connection detected.

▶Subnet Mask Configuration

Subnet masks tell the network which subnet this machine belongs to. The value of each three-digit number separated by dots should not exceed 255.

Parameter Selector

Use this feature to select the parameter of your Subnet Masks configuration.

Subnet Mask

This item displays the current subnet mask setting for your IPMI connection.

Current Subnet Mask in BMC

This item displays the current subnet mask setting for your IPMI connection.

▶Gateway Address Configuration

Enter the gateway address for this machine. This should be in decimal and in dotted quad form (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255 as shown in the screen below.

Parameter Selector

Use this feature to select the parameter of your Gateway Address settings.

Gateway Address

The BIOS will automatically enter the Gateway address of this machine; however it may be over-ridden. Gateway addresses are 6 two-digit hexadecimal numbers separated by dots.

Current Gateway Address in BMC

This item displays the current Gateway address used for your IPMI connection.

▶MAC Address Configuration

This submenu displays the following MAC Address Configuration information.

Parameter Selector

Use this feature to select the parameter of your Mac Address configuration.

MAC Address

This item displays the MAC address of this computer used for your IPMI connection.

Current MAC Address in BMC

This item displays the current MAC address used for your IPMI connection.

BMC Watch Dog Timer Action

Allows the BMC to reset or power down the system if the operating system crashes or hangs. The options are **Disabled** and Enabled.

▶Event Log Configuration

View Event Log

Use this option to view the System Event Log.

Mark all events as read

This option marks all events as read. The options are OK and Cancel.

Clear event log

This option clears the Event Log memory of all messages. The options are OK and Cancel.

PCIe Error Log

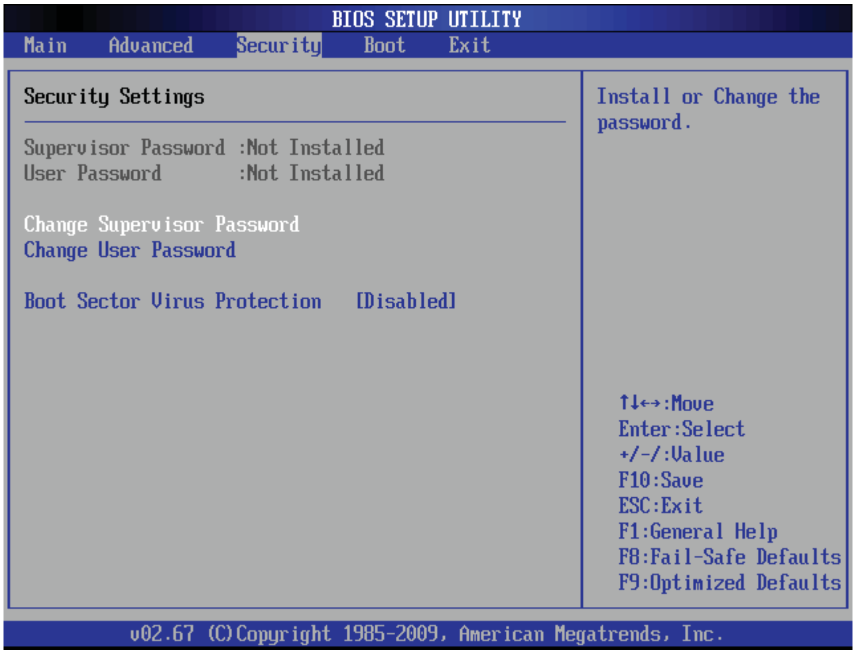
Use this option to enable logging of PCIe Errors. The options are Yes and **No**.

Clear event log

This option clears the Event Log memory of all messages. The options are OK and **Cancel.**

7-4 Security Settings

The AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.



```
Security Settings                                  Install or Change the
                                                   password.
Supervisor Password :Not Installed
User Password       :Not Installed

Change Supervisor Password
Change User Password

Boot Sector Virus Protection   [Disabled]

                                                     ↑↓←→:Move
                                                     Enter:Select
                                                     +/-/:Value
                                                     F10:Save
                                                     ESC:Exit
                                                     F1:General Help
                                                     F8:Fail-Safe Defaults
                                                     F9:Optimized Defaults

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```

Supervisor Password

This item indicates if a Supervisor password has been entered for the system. "Not Installed" means a Supervisor password has not been used.

User Password

This item indicates if a user password has been entered for the system. "Not Installed" means that a user password has not been used.

Change Supervisor Password

Select this feature and press <Enter> to access the submenu, and then enter a new Supervisor Password.

User Access Level (Available when Supervisor Password is set as above)

Use this feature to set the user's access level. Select **Full Access** to grant the user full read and write access to the Setup Utility. Select View Only to allow the user to view the Setup Utility displays without making any changes. Select Limited to allow the user to make changes on limited items such as Date and Time, Select No Access to prevent the user from entering the Setup Utility.

Change User Password

Select this feature and press <Enter> to enter a new User Password.

Clear User Password (Available only if User Password has been set)

This item allows you to clear a user password after it has been entered.

Password Check

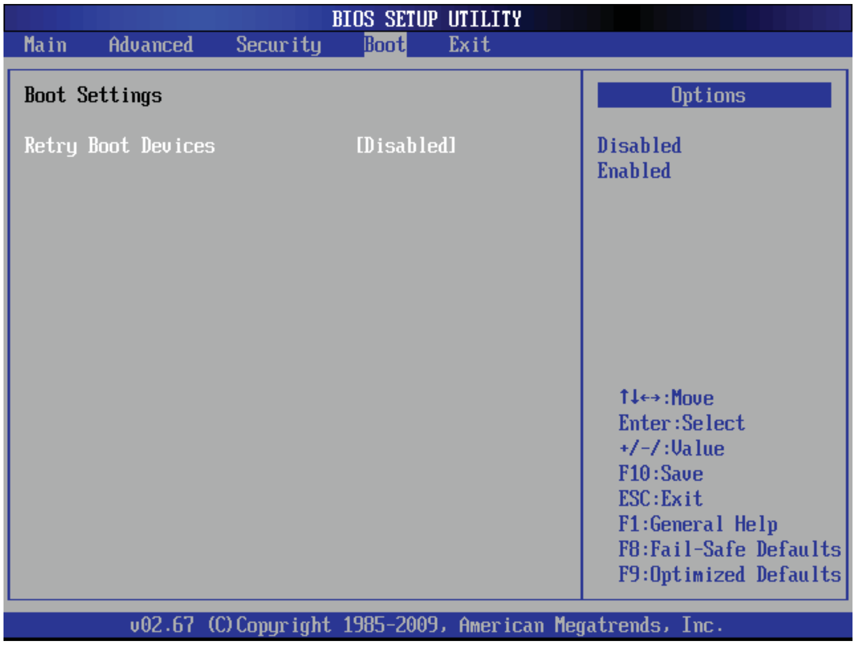
This item allows you to check a password after it has been entered. The options are **Setup** and Always.

Boot Sector Virus Protection

When Enabled, the AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and **Disabled**.

7-5 Boot Configuration

Use this feature to configure boot priority settings.


BIOS SETUP UTILITY
Main
Advanced
Security
Boot
Exit
Options
↑↓↔:Move
Enter:Select
+/-/:Value
F10:Save
ESC:Exit
F1:General Help
F8:Fail-Safe Defaults
F9:Optimized Defaults
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Boot Settings

Retry Boot Devices [Disabled]

Disabled
Enabled

▶Boot Device Priority

Use this feature to specify the sequence of boot priority for onboard devices. The settings are 1st boot device~5th boot device and Disabled.

1st Boot Device - 1st Floppy Drive/2nd Boot Device - [USB: XXXXXXXXX]

▶Hard Disk Drives

Use this feature to specify the boot sequence from all bootable HDD devices. The settings are Disabled and a list of all hard disk drives that have been detected (i.e., 1st Drive, 2nd Drive, etc).

▶Removable Drives

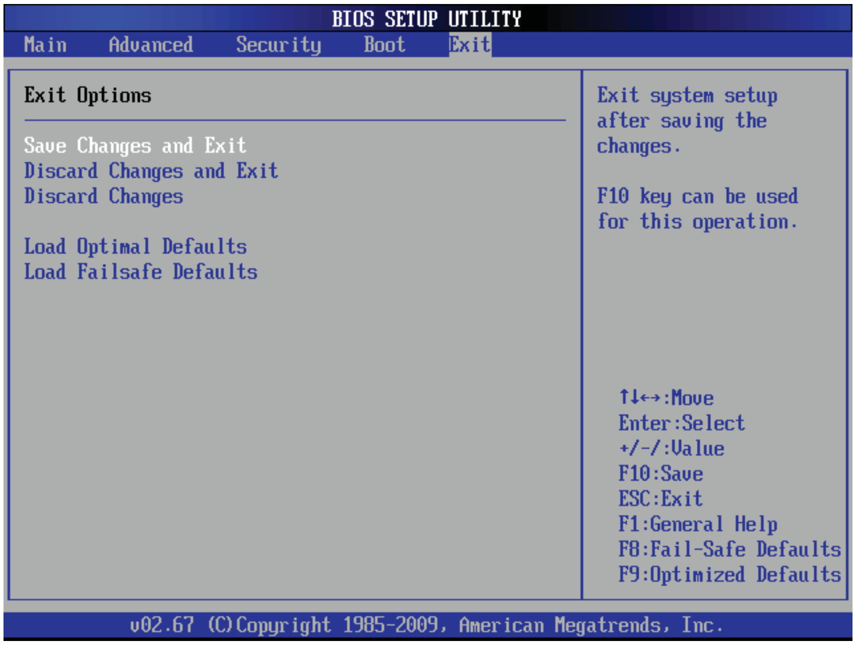
Use this feature to specify the boot sequence from available Removable Drives. The settings are 1st boot device, 2nd boot device, and Disabled.

▶CD/DVD Drives

This feature allows the user to specify the boot sequence from available CD/DVD Drives (i.e., 1st Drive, 2nd Drive, etc).

7-6 Exit Options

Select the Exit tab from the AMI BIOS Setup Utility screen to enter the Exit BIOS Setup screen.



Exit Options

Save Changes and Exit
Discard Changes and Exit
Discard Changes

Load Optimal Defaults
Load Failsafe Defaults

Exit system setup after saving the changes.

F10 key can be used for this operation.

↑↓←→:Move
Enter:Select
+/-/:Value
F10:Save
ESC:Exit
F1:General Help
F8:Fail-Safe Defaults
F9:Optimized Defaults

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Save Changes and Exit

When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

Discard Changes

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS Utility Program.

Load Optimal Defaults

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then, select OK to allow the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.

Notes

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

A-1 BIOS Error Beep Codes

BIOS Error Beep Codes

Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
8 beeps	Display memory read/ write error	Video adapter missing or with faulty memory
1 continuous beep (with the front panel OH LED on)	System Overheat	1 continuous beep with the front panel OH LED on

Notes

Appendix B

Installing Windows

After all hardware components have been installed, you must first configure Intel South Bridge RAID Settings before you install the Windows OS and other software drivers. To configure RAID settings, please refer to RAID Configuration User Guides posted on our web site at www.supermicro.com/support/manuals.

Note: the following instructions apply to installing Windows XP or Windows 2003 only. If installing Windows 2008 or Windows Vista, please follow the instructions displayed on your screen after loading the Operating System CD.

B-1 Installing Windows for a RAID System

1. Insert Microsoft's Windows XP/Windows 2003 Setup CD in the CD drive and the system will start booting up from the CD.

2. Press the <F6> key when the message "Press F6 if you need to install a third party SCSI or RAID driver" displays.

3. When the Windows XP/Windows 2003 Setup screen appears, press "S" to specify additional device(s).

4. Insert the driver diskette "Intel AA RAID XP/2003/2008/Vista Driver for ICH10R" into the floppy drive and press the <Enter> key.

5. Choose the Intel(R) ICH10R *SATA RAID Controller* from the list indicated in the Windows setup screen and press the <Enter> key.

6. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do so at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

7. From the Windows setup screen, press the <Enter> key. The program will automatically load all device files and then continue the Windows installation.

8. After the installation is complete, the system will automatically reboot.

B-2 Installing Windows for a Non-RAID System

1. Insert Microsoft's Windows XP/Windows 2003 setup CD in the CD drive and the system will start booting up from the CD.

2. Continue with the OS installation. The Windows OS Setup screen will display.

3. From the Windows setup screen, press the <Enter> key. The XP/2003 Setup will automatically load all device files and then continue with the installation.

4. After the installation is complete, the system will automatically reboot.

5. Insert the Supermicro Setup CD that came with your system into the CD drive during the system boot, and the main screen will display.

Appendix C

System Specifications

Processors

Two Intel 5500 Series (LGA 1366) processors

Note: Please refer to our web site for a complete listing of supported processors.

Chipset

Dual Intel 5520 chip platforms, including: dual 5520 (IOH-36D) chips and the ICH10R (South Bridge)

BIOS

4 Gb AMIBIOS® SPI Flash ROM

Memory Capacity

Twelve DIMM sockets supporting up to 96 GB of registered ECC DDR3-1333/1066/800 MHz SDRAM or up to 48 GB of unbuffered ECC/non-ECC DDR3-1333/1066/800 MHz SDRAM

Note: See the memory section in Chapter 5 for details.

GPUs (Graphics Processing Units)

Winbond WPCM450 BMC Controller

SATA Controller

Intel ICHR10R on-chip controller for 3 Gb/s SATA (RAID 0, 1, 5 and 10 support)

Drive Bays

Eight (8) hot-swap drive bays housing six (6) standard SATA drives

Peripheral drive bays for three (3) 5.25" drive bays in storage module and one (1) 3.5" fixed drive bay

Expansion Slots

- Four PCI-E Gen. 2.0 x16 slots (Slot 4, Slot 6, Slot 8, Slot 10)
- One PCI-E Gen. 1.0 x4 (in x16) slot (Slot 1)
- One PCI-E Gen. 2.0 x4 (in x16) slot (Slot 2)
- One PCI-E Gen. 2.0 x4 (in x8) slot (Slot 11)
- Two PCI 33 MHz slots (Slot 3, Slot 5)

Serverboard

X8DTG-QF (proprietary ATX form factor)

Dimensions: 13.00" (L) x 15.20" (W) (330.20 mm x 386.08 mm)

Chassis

SC747TQ-R1400B (4U/Tower rackmount)

Dimensions: (WxHxD) 11.8 x 7 x 29.4 in. (452 x 178 x 746 mm)

Weight

Gross (Bare Bone): 72 lbs. (32.7 kg.)

System Cooling

Four 9.2x3.8-cm and two 3.8-cm cooling fans (fan speed controlled by BIOS setting)

System Input Requirements

AC Input Voltage: 100-240V

Rated Input Current: 12-7A

Rated Input Frequency: 50-60 Hz

Power Supply

Rated Output Power: 1400W w/PFC (Part# PWS-1K41P-1R)

Rated Output Voltages: +12V (116A), +5Vsb (4A)

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)

Non-Operating Temperature: -40º to 70º C (-40º to 158º F)

Operating Relative Humidity: 8% to 90% (non-condensing)

Non-Operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”

Notes

(continued from front)

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